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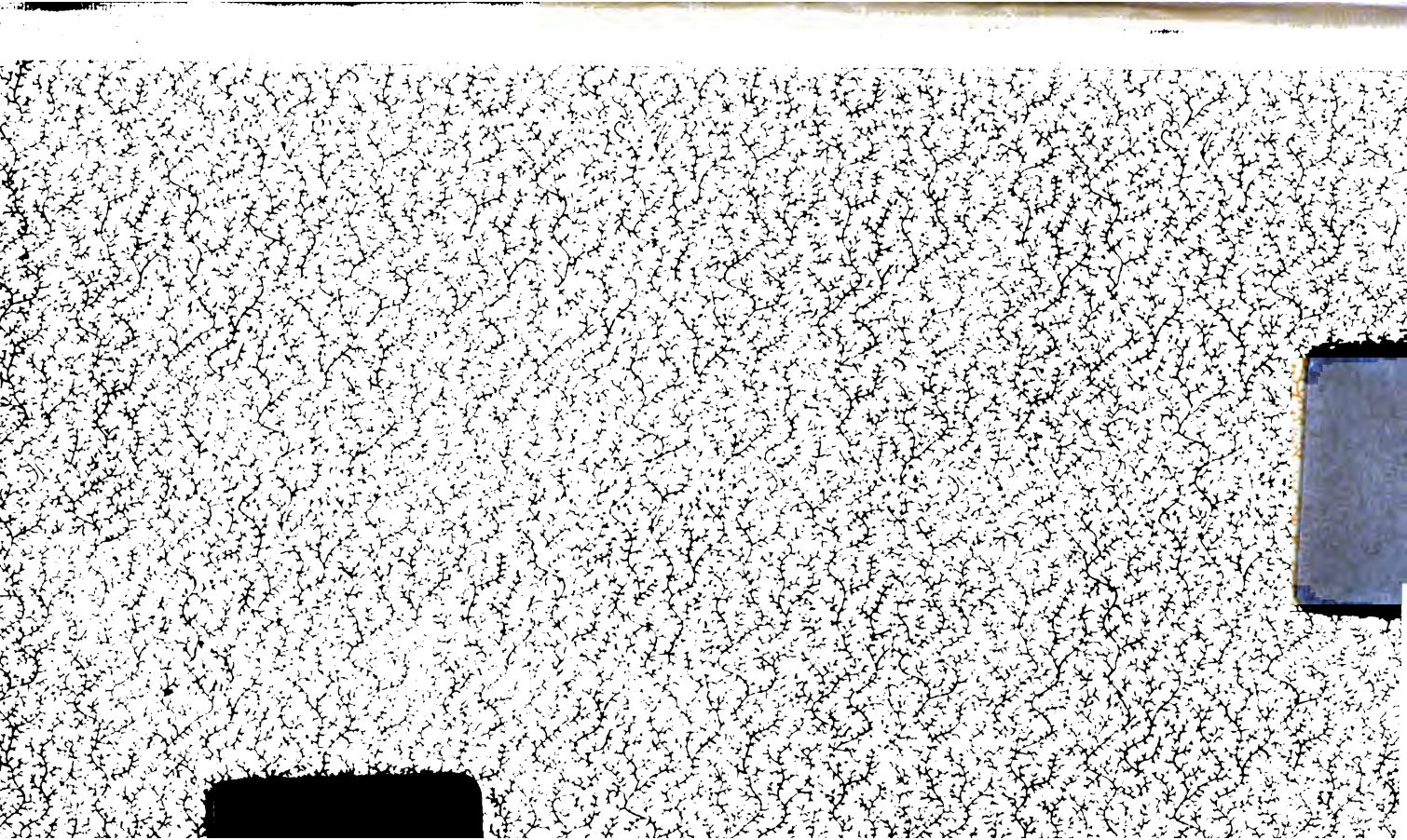

ANNEX

Ocean
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MARITIME GEOGRAPHY

AND

STATISTICS,

OR

A DESCRIPTION

OF THE

Ocean and its Coasts,

MARITIME COMMERCE, NAVIGATION,

&c. &c. &c.

"Le Trident de Neptune est le Sceptre du Monde."

BY JAMES HINGSTON TUCKEY,

A Commander in the Royal Navy.

IN FOUR VOLUMES.

VOL. I.

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TO THE

RIGHT HONOURABLE

LORD VISCOUNT MELVILLE,

FIRST LORD OF THE ADMIRALTY.

My Lord,

To the tribute of respect intended by this Dedication, your Lordship has far stronger claims than those of rank or office; for, in the history of our naval administrations, with the name of Melville will be found coupled the endearing title of Friend of the Navy.

The measures of melioration, effected in every class of the service, are, indeed, equally honourable

honourable to your Lordship's head and heart. But however grateful it would be to my feelings to dwell on the happy results of these measures, I am aware that my pen can add nothing to the general sentiments of respect and gratitude which animate the Navy towards your Lordship, and with which sentiments I have the honour, my Lord, to subscribe myself,

Your Lordship's

Most devoted and most faithful

Humble servant,

J. H. TUCKEY.

London, March 30, 1815.

PREFACE.

In a nation so essentially maritime as Great Britain, the greater part of whose population exists by the Ocean, and whose glory and independence are chiefly founded on the Sovereignty of the Seas, it seems strange that no comprehensive work on Maritime Geography has hitherto been offered to the Public; an attempt to fill up this blank in our national literature cannot but be considered as useful, and consequently meritorious, and it is this conviction that emboldens us to send the following work into the world, with a perfect confidence in the indulgence of a liberal Public.

If it should be asked how a naval officer could, during the activity of war, find leisure

to compile a work requiring the perusal of many thousand volumes, the answer is unfortunately too ready: it was undertaken to pass away the tedious hours of a hopeless captivity, alike destructive of present happiness and future prospects.

The intention, in the plan adopted, was to produce a work which, with respect to reference, should possess the utility of a gazetteer, while by connected description it might bear a continuity of perusal. How far we have succeded in this attempt, we must leave to the unerring judgment of the Public; we, however, owe it to ourselves to premise that a portion of its imperfections are attributable to accident, a part of the manuscript having been lost on the disastrous march which, as a prisoner of war, we were obliged to make through France at the commencement of the past year, and which we have been only able to supply in a hasty and consequently imperfect manner.

The

The notes are not offered to the naturalist but to the seaman, in the hope of drawing him from his too general apathy, and of inspiring him with the desire of *noticing*, *examining*, and *comparing* the various objects of natural history, which he is constantly meeting with, and passing by with indifference.

The sources from which we have compiled are so many, that the enumeration would swell the work without any correspondent utility. We must however notice the "Précis de la Géographie Universelle" of Malte Brun, the statistical works of Catteau Calleville on the North of Europe, from which we have largely translated in the first volume. In the second our chief sources have been the great national statistical work now publishing in France; La Borde's Spain; Murphy's Portugal; Thornton, Eton, &c. on Turkey. For the third volume, Mr. Horsburgh's India Directory and Mr. Milburn's Oriental Commerce

merce have afforded us considerable matter: and in the fourth volume, Morse, Volney, Beaujour, and Humboldt, have been our chief authorities for America.

ADVERTISEMENT.

It may be proper to apprize the nautical reader that this work not being intended as a *sailing directory*, minute accuracy has not been attended to in the relative bearings and distances of places; neither does the author guarantee the *perfect* exactitude of the hydrographical descriptions of harbours, banks, &c. as far as respects depths of water, tides, or channels. This advertisement is intended to prevent implicit confidence being placed in these descriptions, in the conducting of vessels, which might possibly be attended with danger.

Having often found the want of a catalogue of books necessary to be consulted in the compilation of this work, we are inclined to believe that our readers will find very useful the following

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1,	9,	*from bottom, for* strait *read* straight.
3,	10,	*for* where *read* whose.
14,	8,	*for* origin. As *read* origin, as. Note, *for* new extremity *read* north west extremity.
22,	17.	*for* was correct *read* were correct.
36,	4.	*from bottom,* for depressions *read* depression.
431,	1.	*for* it is, *read* it be.
56,	3,	*for* continent *read* continents.
61,	16,	*for* 1.236 *read* 0.419.
—,	8,	*from bottom, for* 0·387 *read* 0.121.
66,	11,	*from bottom, for* has *read* have.
74,	4,	*from bottom, for* coast *read* coasts.
84,	5,	*for* cloud *read* mass.
92,	9,	*for* Hamilcar *read* Himilcar.
106,	22,	*for* Cape Roxo read Cape Blanco.
136,	12,	*for* unhospitable *read* inhospitable.
145,	1,	*for* Pauliere de Goville read Paulmiere de Gonneville.
151, 7 & 15,		*for* indices *read* indications.
154,	1,	*for* Kruzenstein *read* Krusenstern.
163,	9,	*for* form rivulets *read* forms rivulets.
210,	10,	*for* Adam Canon, of, *read* Adam, Canon of.
219,	3,	*from bottom, for* Aland the, *read* Aland and the.
292,	antepenult,	*for* island *read* islands.
307,	7,	the Anciam *dele* the.
385,	10,	*for* legislature *read* legislation.
374,	3,	*from bottom, for* was *read* were.
432,	10,	*from bottom, for* Hiestrom read Fliestrom.
444,	6,	*from bottom, for* their objects *read* these objects.
517,		*for* LINRAL *read* LINEAR.

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* The reader is requested to add the following elevation and positions.

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		Lat.	Lon.
P. 598, *Tab.* IX.	Scaw light	57° 40′ N.	10° 37′ E.
	Eut. Elbe	54	8 21
	Hamburg	53 34	9 58
	Bremen	53 4	8 48
	Amsterdam	52 22	4 50
	Rotterdam	51 54	4 27
	Flushing	51 26	3 34
	Antwerp	51 13	4 24

INTRODUCTION.

Explanation of Marine geographical Terms.

Ocean. In its most extensive sense the Ocean signifies the whole body of water that surrounds the earth; but this vast liquid mass is divided into several portions or basins, which also bear the name of Oceans, as the *Atlantic* and *Pacific.*

Sea. A portion of the ocean confined between portions of the continents or enclosed by islands. Those which penetrate into the continents, and have but one entrance or communication with the ocean, are properly Mediterranean seas; such are the *Mediterranean,* and the *Baltic.* Those bounded by the continent on one side and on the other by islands, or entirely enclosed by the latter, may be called interior seas; such are the *Caribbean,* the *China,* the *Java* or *Sunda sea.*

Channel. Properly signifies the passage by which a ship can sail between islands and shoals, or into a harbour; thus we say a narrow or wide, a deep or shallow, a strait or winding channel. Channel is also used for considerable branches of the ocean, separating islands from the continent,

or from each other, as the *English* and *Irish channels*, the *channel of Formosa*, of *Borneo*.

STRAIT or STRAITS. A narrow channel into Mediterranean seas, or between islands, as the *Strait of Gibraltar*, of *Dover*, of *Sunda*.

GUT. The name given by seamen to the narrowest part of some straits, as the *Gut of Gibraltar*, of *Canso*. In some of the West India islands, gut signifies a creek.

SOUND. Either an inlet of the sea, as *Norton*, *Norfolk* Sound on the N. W. Coast of America, or a channel between islands, &c. as *the Sound* between Sweden and Denmark, or, finally, certain harbours, as *Plymouth Sound*, the Sounds among the Scilly islands.

GULF—BAY. These denominations are applied so arbitrarily to indentations of the sea coasts of all sizes and shapes, that it is difficult to assign to each a determinate limit. A *gulf*, however, conveys the idea of greater magnitude than a *bay*, and hence it would be more correct to give the former denomination to those great indentations of *Biscay*, of *Bengal*, &c. which we call bays.

BIGHT. A term used to denote a bend of the coast, seems to be restrained to those whose curves have little depth, as the *Bights of Benin* and *Biaffra*.

COVE. A small indentation on the shore of a bay or harbour, is properly limited by two projecting points of land, which shelter it; a *sandy cove* is one whose beach is composed of fine sand, on which boats can land with facility and safety.

PORT.

PORT. A general term denoting a place capable of receiving shipping.

HARBOUR. A port where shipping can discharge and refit in perfect safety; it is usually formed either by the mouth of a river, or an inlet of the sea. A *tide harbour*, one which can only be entered at certain times of tide, the channel not having sufficient depth of water at other times. A *dry tide harbour* has its bottom left dry at low water. A *bar harbour* is one where entrance is crossed by a *bar* or *bank*, to go over which shipping are obliged to wait for fair weather or rise of tide.

HAVEN. Synonymous with harbour.

ROAD or ROADSTED. An anchoring place more or less exposed; thus an *open road* is on a straight coast where a ship is entirely exposed to the sea.

INLET. An arm of the sea penetrating into the land. CREEK, a small inlet generally branching from a river, and capable of receiving only small craft or boats.

LAGOON. A shallow lake, formed by the penetration or filtration of the sea water on the shores.

COAST. A general name for shores washed by the sea. A *clean coast* is one free from danger; a *foul coast* one lined with rocks or shoals. A *bold coast* one which is steep-to and may be closely approached. An *iron bound coast* is where the rocky shores rise perpendicularly from the sea and have no anchorage close to them. *Trending*

of the coast, its direction, as the coast trends N. E. that is, its direction is to the N. E.

SHORE. The margin of the land washed by the sea; it is used as synonymous with *coast*, but more generally in a less extended sense, meaning a particular point of the coast.

BEACH. The low margin of the sea, denominated according to the substance of which it is composed, a *sandy*, *stony*, &c. beach.

STRAND. The margin of the sea or of a river.

PROMONTORY. A great projection of the land into the sea, as the southern extremity of Africa.

CAPE. Often used as synonymous with promontory, strictly denotes a lesser projection of the land.

HEAD. A high, bluff and usually steep but not very salient projection of the coast. *Head lands* denote projections in general.

POINT. An angular and generally low projection of the coast.

HUMMOCK. A little conical hillock on or near the coast.

BANK. An elevation of the bottom of the sea, generally applied to those which have sufficient water over them for the safe passage of ships.

SHOAL. A bank approaching to, or rising above the surface of the sea.

REEF. A bank of rocks level with or but little under the surface.

LEDGE. A reef with deep water close to it.

BREAKERS. A reef on which the waves break.

KNOLL. A little hillock under the surface of the sea.

Overfalls. Depths of the bottom greatly and suddenly varying.

Swash. A deep channel in a bank or shoal.

Race. The rushing of the tides round a point of land or through a channel, where the bottom is rocky produces a violent commotion of the waters, as in the race of Portland and race of Alderney.

Surf. The breaking of the waves on the sea beach.

Archipelago. A large assemblage of islands, from Ægeo pelagus, a name originally given by the Greeks to a branch of the Mediterranean (Ægean Sea) and for which various significations have been given, as the Holy Sea, the Great Sea, the Sea of Goats, from its islands appearing at a distance like a flock of goats, or from its waves having a jumping motion like these animals.

Foreign Terms usually joined to the proper Names of Places, and met with in this Work.

Aber, from *abar*, Gaelic, a marsh. The mouth of a river

Albufeira, *Span.* Albufeira, *Port.* A lagoon or salt marsh, from al and buar, Arabic, a little sea.

Angra, *Span. Portug.* A bay or creek.

Bahr, *Persian.* Sea, great gulf.

Baxios, *Span. Portug.* Vulgo bassas. Shoals or reefs.

Berg, *Northern dialect.* A hill.

Boca, *Span. Portug.* The mouth of a river.

Boghas, *Turkish.* A channel in which the waters are violently agitated.

Borg, Burg, whence Bourg, Burgh, *Northern dialects.* A fort, citadel, or strong place.

BOUROUN, *Turkish.* A cape.

BENDER, *Oriental dialect.* A harbour.

CALA, *Ital.* A cove.

CAYS, (*Cayo Span.*) Sandy or coral islands chiefly in the West Indies.

DIEP, *Ger.* A deep channel through shoals on the coast of Germany.

EID, *Norweg.* An isthmus.

ELV, *Norweg.* and *Swedish.* A river.

ENNIS or INNIS, *Scotch* and *Irish.* An island.

ENSEADA, *Portug.* ENCENADA, *Span.* A small bay or cove.

FARELLON, *Spanish, Portug.* An islet or rock above water.

FIORD, FORD, *Northern dialect.* An inlet of the sea or channel within islands.

FIUME, *Ital.* A river.

FORTALEZA, *Span. Portug.* A fort chiefly on the coast of Brazil.

FRITH, *Scottish.* An arm of the sea or entrance of a large river.

GATT, *Dutch.* A narrow channel.

GOUBA, *Russian.* A gulf.

HAF, *Northern dialect.* A sea.

HAFEN, HAVN, HAMN, *Northern dialect.* A haven.

HOLM, *Northern dialect.* An island of middle size with herbage.

INCH, *Scottish.* An island.

JOCKI, *Finland.* A river.

JOCKUL, *Iceland.* A mountain whose summit retains the snow.

KAMEN, *Russian.* A rock.

KLINT, *Dan, Swed.* Rocky cliffs.

KOEBING,* KOEPING, *Northern dialect.* A market, denotes a market-town.

LEMAN.

* The *oe* or *ö* is pronounced as the English *e* in hot.

LIMAN, *Turkish.* A little bay or cove.

LOUGH, *Scottish* and *Irish.* A lake, a basin formed by the penetration of the sea.

MORE, *Russian.* A sea.

MORNE, in the *French West-Indies*, a little mount.

MORRO, *Span. Portug.* A head land or prominent hill.

MUNDE, *German.* The mouth of a river.

NAHR, *Syria.* A torrent.

NAZE, NAES, NESS, NOSS, *Northern dialect.* A cape.

NISI, *Modern Greek.* An island.

OE or O, *Danish, Swedish.* An island.

ORT, *Northern dialect.* A point of land.

OSERO, *Russian.* A lake.

OSTROF, plural OSTROVA, *Russian.* An island.

OSTROG, *Russian.* A village surrounded by palisades.

POTAMOS, *Modern Greek.* A river.

PULO, *Malay.* An island.

RAS, *Arabic.* A cape.

RIEKA, *Russian.* A considerable river.

RIO, *Span. Portug.* A river.

SCAR, *Northern dialect.* A rock above water.

SELO, *Russian.* A little town.

SIERRA, *Span.* A ridge or chain of mountains.

SIMA, *Chinese, Japanese.* An island.

SKERRY, *Scottish, Irish.* A little rocky islet.

SOUI, *Turkish.* A river.

STAD, STADT, *Northern dialect.* A city or town.

TANJONG, *Malay.* A point of land.

UDDE, *Northern dialect.* A head land.

VAR, *Norweg.* A flat rocky island.

VAERN, *Northern dialect.* Defence, rampart.

VIG, VIK, or WIG WIK, *Northern dialect.* A little bay or cove.

Latitude and Longitude.

LATITUDE is the distance of any place from the equator reckoned on a meridian, or great circle of the globe passing through the Poles.

LONGITUDE is the angle formed by the meridian of one place, with that of another, to which any nation has given the arbitrary denomination of *first;* for all the meridians being great circles, nature affords no motive to choose any one in preference. Ptolemy placed the *first meridian* at the *Fortunate Islands* (Canaries), because they were the western limits of the then known world. Louis XIII, in order to render uniform the manner of expressing the longitudes in the French geographies, ordered the *first meridian* to be drawn through the isle of Fer, the westernmost of the Canaries.

The Dutch fixed their *first meridian* at the *Peak of Teneriffe*, which was then considered as the highest mountain of the globe.

Gerard Mercator in the sixteenth century chose the meridian passing through the isle of *Corvo*, one of the Azores, because in his time it was the line of no variation of the compass.

At present the English place their *first meridian* at their royal observatory at *Greenwich*, which is still adhered to by the Anglo-Americans of the United States; the French at their observatory at Paris, while the other maritime nations continue generally to reckon from the isle of Fer.

The

The differences of longitude between these various meridians and Greenwich observatory are,

Paris - - -	2°	20′	15″ E.
Peak of Teneriffe	16	39	45 W.
Isle of Fer - -	17	39	45 W.

The longitude is in general reckoned east and west from the first meridian to 180 degrees; though some geographers and navigators reckon it entirely round the globe, that is, beginning at the first meridian, they reckon to the east 360 degrees, to return to the same meridian.

Hydrographical division of the Globe.

The vast body of waters, that covers nearly three-fourths of the surface of our planet in its general and collective sense, is named *the Ocean*: for the convenience of geographical description, its various branches have received distinctive denominations, which are often relative to their positions with respect to particular countries, and consequently correct as to those countries only; such are the *North Sea*, between Great Britain and the Continent, the *North Sea* between North and South America, the *Western Ocean*, &c. while the names given to other branches are absolutely absurd, as the *South Sea* and *Pacific*, which are still attached to the vast ocean that separates Asia and America, although it extends to both the polar circles, into the regions of eternal storms. An approved writer on this subject justly observes, that

that the geographer should not belong to either continent, but should hover over the globe, and while he observes it rolling under him, should attach to each part of the ocean a denomination capable of being adopted with equal propriety by all the people of the earth. * In the following hydrographical division of the globe, we have in general followed the nomenclature proposed by this writer; but we have also thought it necessary in some instances to deviate from it, and for several considerable portions of the ocean, which he has left unnamed, we have presumed to offer denominations.

If we cast our eye over a map of the world, we observe that the ocean is contained in two great basins, and some lesser ones. Commencing at the northern extremity of our hemisphere, we see the

Northern Frozen Ocean.

Northern Frozen Ocean, or *Arctic Sea*, surrounding the North Pole, and washing the northern extremities of both the old and new continents, its limits being the polar circle. Its branches are the *White Sea*, more properly the *Lapland Sea*, and, if it exists, *Baffin's Bay*.

Atlantic.

The great basin of the ocean, which separates Europe and Africa from America, or the Atlantic, † commences at the northern polar circle, and is limited on the south by a line drawn from the Cape of Good Hope to Cape Horn. The portion of this

* Fleurieu, Intro. Voy. de Marchand.

† By some supposed to derive its name from the Atlantic Island of Plato, but by others, with more probability, from its washing the foot of Mount Atlas. The name of Western Ocean is usually given by English seamen to the portion of it between Europe and America.

this ocean north of the tropic of Cancer will be the *North Atlantic*, that south of the tropic of Capricorn the *South Atlantic*, and that included between the tropics, the *Equinoctial Atlantic*. The branches of the North Atlantic on the side of the old continent are, 1. The *Sea of Norway*, comprised between the coasts of Norway and Iceland, and the Zetland and Ferroe islands, extending from the Polar Circle to the 60°.

2. The *British Sea*, between Great Britain and the Continent from the 60° to the Strait of Dover. The name of *North Sea* given to this branch of the Atlantic, first probably by the Dutch, in whose country alone it is applicable, has been generally adopted by the French and English, particularly in their sea charts; it is also frequently designated by its ancient name of the *German Ocean*.*

3. The *Baltic* communicates with the British Sea by the *Scagerack* and *Cattegat*, the respective limits of which not being defined, we propose to confine that of *Scagerack* to the space between the south coast of Norway and the N. W. coast of Jutland, which extends nearly N. E. and S. W, and to leave that of *Cattegat* to the channel between the east coast of Jutland and the coast of Sweden, whose direction is nearly N. and S.

4. The *English Channel*, separating England from France.

5. The

* The denomination of *Gulf* of Great Britain is proposed by Fleurieu, but both its nature and extent seem more properly to place it in the class of *internal seas*.

5. The *Irish Channel*, sometimes improperly called the *Irish Sea*, separating Great Britain and Ireland.

6. The *Bay of Biscay*, washing but twenty leagues of the coast of Biscay, while it has 120 leagues of the coasts of France, should receive the name of the *Gulf of France*.

7. The *Mediterranean* is the last branch of the North Atlantic on the side of the old continent, and the Equinoctial Atlantic on this side has only the *Gulf of Guinea*, between Capes Palmas and Negro.*

On the American side of the North Atlantic, the branches are, 1. *Davis' Strait*, separating the southern extremity of Greenland from the continent of America, and forming the entrance into the problematical *Bay of Baffin*. The name of Davis' Strait we propose to confine to the narrowest part of this channel at the polar circle, and offer that of *Sea of Labrador* for the large space between Labrador and Greenland, commencing at Cape Charles on the former and Cape Farewell on the latter. 2. *Hudson's Bay*, which being a proper Mediterranean sea, is very improperly named a bay.

On the American side of the Equinoctial Atlantic are the *Gulf of Mexico* and the *Caribbean Sea*,† the latter between the West India islands and the American continent.

Quitting

* The same writer proposes the name of Gulf of Congo for the space between Capes Lopez and Negro, and confines that of Gulf of Guinea to the space between Capes Palmas and Lopez.

† Mer des Antilles of Fleurieu.

Quitting the Atlantic and doubling the promontory of Africa, we enter into the *Indian Sea*,* an extensive branch of the ocean, bounded on the west by the east coasts of Africa and Arabia, on the north by India, on the east by the west coast of New Holland, or Terra Australis, and the Great Asiatic Archipelago, and on the south by a line drawn from the Cape of Good Hope to the S. W. point of New Holland. Indian Sea.

The branches of the Indian Sea on the west are, 1. the *Channel of Madagascar*, or of *Mosambique*, separating the island of Madagascar from the continent; 2. on the N. W. the *Great Gulf of Arabia*,† sometimes called the *Sea of Oman*, the limits of which are Capes Guardafui and Comorin. The *Red Sea*‡ and *Gulf of Persia*§ are branches of the Great Gulf of Arabia; the former is entered by the *Strait of Babelmandeb* from an outer gulf, which having no name, we propose to call the *Gulf of Socotra*, from the island situated at its entrance. The Gulf of Persia is entered by the Straits of Ormus, also from an outer gulf, for which we offer the name of the *Gulf of Muscat*, from the most considerable place in it. The N. E. extremity of the Indian Sea forms the *Bay of Bengal*, which with more propriety would be named the *Gulf of Indostan*;‖ its limits are the south point of Ceylon and the N. W. point of Sumatra. On the east the Indian Sea forms a large gulf between the Sunda isles on the north and New Holland

* Great Gulf of India. Fleurieu. † Gulf of Sinde. ib. ‡ Sea of Arabia. ib.
§ Sea of Persia. ib. ‖ Gulf of the Ganges. ib.

land on the south, for which we propose the name of *Gulf of New Holland.* *

Seas of the Malay Archipelago.

To the east of the Indian Sea and within the Tropics, are several portions of the ocean, forming seas enclosed by the islands of the Malay Archipelago: though more naturally referable to the Pacific Ocean, to whose action they evidently owe their origin. As they have been always included in the vague denomination of *Indian Seas*, we shall notice them here, in order to avoid all deviation, not absolutely necessary, from the popular hydrographical division of the globe. The first is the *China Sea*, which though it washes but a small extent of the Chinese coasts, deserves to retain its name, as having been adopted by the geographers and navigators of all nations. To its southern extremity between Sumatra and Borneo, we shall give the name of the *Channel of Borneo.* By this channel the China sea communicates with a branch of the ocean enclosed between the islands of Borneo, Celebes, and the Moluccas on the north, the Sunda islands on the south, and New Guinea on the east; for this space, which seamen usually divide into the seas of *Java*, *Celebes*, and the *Moluccas*, we offer the general name of *Sunda Sea.* The Sunda Sea communicates by the *Straits* of

* In the old Dutch charts this gulf is called the Sea of Lin-chidol, which seems to be a corruption of the Javanese words Laout Kidol, or South Sea, the name given to it by the Javanese, with reference to their islands. Fleurieu proposes for it the name of the Sea of New Guinea, but as it only washes the new extremity of that island, while it is bounded on the south by the whole north coast of New Holland, it seems more proper that the latter should attach its name to it.

of *Matuasan*, or more properly the *Channel of Celebes*, separating Borneo and Celebes with another branch, bounded on the N. W. by the Island of Palawan, on the north by the Philippines, and on the south by the north coast of Celebes. This sea consists of two basins, separated by a chain of small islands, extending from the west end of Mindanao to the N. E. end of Borneo, and called the Sooloo Archipelago, whence the name of *Sooloo Sea* has been given to these two basins, and which there is no reason to change. *

Grand Ocean.

The second great basin of the ocean separates Asia and America. As we have before observed, it still retains the general denominations of South Sea and Pacific Ocean; the first of which it probably received from its earliest discoverers, who viewing it from the Mountains of Darien, considered its position as only relative to the West Indian Sea, which lay to the north of them. The name of Pacific, which, as a general denomination, is not more admissible than that of South Sea, was also given by the early Spanish Navigators, who in sailing along the coasts of Mexico and Peru, experienced only the moderate breezes and fair weather of the tropics, and hence gave this portion of the ocean the name of *El Mer Pacifico*. The name of *Grand Ocean*, having no relation to any particular quarter of the globe, has been properly proposed for this great basin.

The

* Fleurieu proposes the name of Philippine Sea; but this denomination we have given to a branch of the Pacific, hitherto unnamed.

The great divisions of the Grand Ocean will be, 1st. The *Great Northern Ocean*, extending from the Artic Circle to the Northern tropic; 2d. The *Pacific*, or *Grand Equinoctial Ocean*, included between the tropics; 3d. The *Great South Sea*, extending from the Southern tropic to the South Cape of Van Diemen's Land and Cape Horn.

The *Great Northern Ocean* has several branches; the first of which to the North is comprized between the N. E. extremity of Asia, the N. W. extremity of America, and the Aleutian Islands, for which has been proposed, with great propriety, the name of *Behring's Basin*, from the Navigator who first visited it. On the coast of Asia to the N. W. it forms the *Gulf of Anadyr*, and on that of America to the S. E. the great *Bristol Bay* of Cook. Following the coast of Asia to the South, we meet a series of internal seas from Kamtschatka to Formosa; the first bounded by Kamtschatka on the East and by Russian Tartary or Siberia on the West and North, is named by the Russians, the *Sea of Ochotsk*, from a miserable town and river on it, and the *Sea of Lama* by the Tongouth Tartars who inhabit its shores; in some geographies it is also called the Sea of Kamtschatka; as more appropriate, we propose to name it the *Sea of Tartary*, and to leave that of *Gulf of Ochotsk* to its western extremity.

The second of the chain of interior seas is bounded by Chinese Tartary on the West, by the island of Sagalin on the North, and by the Japan islands

chain on the East and South, it has been called, with propriety, the *Sea of Japan.**

On the South, the Sea of Japan communicates with a third internal sea by the *Strait of Corea*, between Corea and the Japan islands. This basin is bounded by Corea and the continent of China on the North and West, by the Lieukieu and other Chinese islands forming a chain from Japan to Formosa, on the East and South. The name of *Sea of Corea* has been proposed for it. The gulf which it forms on the North between Corea and China is called by the Chinese the *Yellow Sea* (Hoang-hai), from the muddiness of its water, but which may with more propriety be named the *Gulf of Corea*. The Chinese (from the clearness of its waters) give the name of *Blue Sea*, to the portion of the sea of Corea, between the South coast of the Peninsula and the island of Formosa.

The Pacific or Grand Equinoctial Ocean has several branches included between the numerous chains of islands from Formosa on the N. W. to New Caledonia on the S. E. and which call us for a complete creation of nomenclature. 1. The space between Formosa and the Philippines on the West, the chain of Mariannes on the East, and the Pelew islands on the South, for which we propose the name of the *Philippine Sea*. 2. The

* Klaproth proposes for the two last mentioned basins the general name of *Sea of Tartary*, distinguishing them into North and South basins; the separate denominations we offer seem equally proper, and less susceptible of confusion.

space between the chain of New Philippines or Carolinas (of which the Pelew islands are the western extreme) on the North, Lord Mulgrave's range on the East, and New Guinea and Solomon's islands or the Papua Archipelago on the South, which we shall call the *Papua Sea*. 3. The space of the Grand Ocean comprized between the Papua Archipelago on the North, Terra Australis or New Holland on the West, the New Hebrides, New Caledonia and New Zealand on the East may, with propriety, be called the *Sea of New Holland*, or of Australia. At its N. W. extremity, it forms the *Gulf of Louisiade* of Bougainville, which by *Torre's Strait* communicates with the *Gulf of New Holland* and Indian Sea.

On the coast of America South of Behring's basin the Grand Ocean has but three gulfs of any consideration. 1. That formed by the Peninsula of Alaska on the West, and the Continent on the North and East. As this great indentation is yet without a denomination, we shall here take occasion to pay the tribute of respect to the two Navigators, whose persevering researches first made known its coasts, and we, therefore, offer for it the name of the *Gulf of Cook and Vancouver*. 2. The gulf formed within the Peninsula of California, called by the Spaniards the *Vermilion Sea*, but for which it has been proposed to substitute that of the *Gulf of California*. 3. The *Gulf of Panama*, between North and South America, and only separated from the Caribbean Sea by the isthmus of Darien, 37 miles in breadth, but whose

mountains of granite bid defiance both to the assaults of the ocean and the industry of man to form a passage through them, which could it be effected, would form as grand an epoch in navigation and commerce, as the discoveries of the passage of the Cape or of the New World.(4)*

The two last grand divisions of the ocean approach the South pole. 1. The *Great Southern Ocean*, which is a prolongation of the Atlantic and Grand Oceans and of the Indian Sea, is limited on the South by the polar circle, beyond which, surrounding the pole is 2. The *Southern Frozen Ocean*, or Antarctic Sea.

Of the Ocean.

General Utility.

The Ocean, by its exhalations which moisten and refresh the atmosphere, supports vegetable life, and aliments the streams of running water, which, though ever flowing, are never exhausted,† without the benign influence of its vapours the whole earth would become an inanimate desert, for the drying up of the ocean would probably be alone sufficient to destroy all organized nature. This vast body of water serves also to decompose a great part of the corruptible matter of both the vegetable and animal reigns, while by opening a boundless field for navigation, it unites nations

* See notes at the end of the volume.

† According to the calculations of Halley, the vapours which arise from the ocean, and which the winds convey to the land, are sufficient to create and replenish all the rivers and other waters at the surface of the earth.

whom impassible mountains and immense deserts would otherwise have separated for ever.

Coasts. The shores washed by the ocean are of three natures, 1. Elevated and rocky, sometimes composed of perpendicular cliffs several hundred feet high;(B) 2. Downs or coasts formed of sand-hills accumulated by the waves and winds; 3. Low coasts generally formed by the retiring of the sea.

Depth. The irregular depths of the ocean prove its bottom to be similar to the surface of the continents, and that if left dry it would in like manner present mountains, valleys, and plains. It is only by this analogy that we can form any estimate of its greatest depth, and it leads us to conclude, that the mountains of the continents correspond with the abysses of the ocean; but the highest mountains do not exceed 20,000 feet, and if we allow half that quantity for their degradation by the action of the elements since their formation, we must conclude, that the greatest depth of the ocean does not exceed 30,000 feet.* The depth of the sea near the shores is generally observed to be in proportion to their height and declivity, deep water being found close to elevated and steep shores, and shallow water near low ones.

The bottom of the ocean, as far as has been ascertained, is composed of sand, gravel and rock, mixed

*The ocean need not, however, have one-third of this depth, to be unfathomable by our common sounding instruments. The greatest depth that has been sounded is eight hundred and ninety-one fathoms, by Ellis in his voyage to Hudson's Bay, without finding bottom.

mixed with the spoils of testaceous animals and coralaginous substances; in many places, these latter cover the bottom so as to resemble petrified forests, while in others, masses of granite rise towards the surface.

The level of the waters of the ocean is, generally speaking, every where the same, and this effect is produced by the equal pressure of the molecules of all fluids in every direction: hence the ocean taken collectively has a spherical or rather a spheroidical surface which may be considered the true surface of our planet. As exceptions to this general level, it has been pretended that the Baltic and Zuyder Zee are higher than the British Sea, the Red Sea than the Mediterranean, and that there is a difference in the levels of the Atlantic and Pacific Oceans on the opposite sides of the isthmus of the Darien; but the facts on which these suppositions rest are by no means sufficiently verified, and with respect to the Baltic in particular, the contrary has been proved by recent experiments. It seems however probable, that gulfs or internal seas open to the East are higher than the main ocean, from the accumulation of waters in them by the constant movement of the sea from East to West.

Saltness.

The water of the ocean, besides pure water, contains many foreign substances, the proportions of which vary in different places: the most common are *Muriatic Acid, Vitriolic* or *Sulphuric Acid, fixed Mineral Alkali, Magnesia* and *sulphated Lime*. The degree of saltness also varies with the

localities, or from adventitious causes,(D) and in many places it has been found to be less at the surface than at a considerable depth.(E) Naturalists have proposed different solutions for the phenomenon of the saltness of the sea, some supposing it to be caused by primitive banks of salt at the bottom; but if such banks exist, they are probably rather formed by the deposition of the saline particles of the water, than the cause of its saltness. Halley and Buffon ascribed it to the corruption of vegetable and animal matter, conveyed to the sea by rivers; for it being certain that the fresh water received by lakes that have no outlet, corrupts, is decomposed, and forms depositions of salt, they considered the ocean as a vast lake, the common reservoir of all the fresh waters of the globe. But if this hypothesis was correct the saltness of the sea must be continually increasing, which there seems to be no reason for supposing. Many naturalists of the present day conceive the ocean to be the residue of a primitive fluid, that held in dissolution all the substances of which the earth is composed, and that after this fluid had deposited all the earthy and metallic particles, there remained in the residue or actual sea some of the saline elementary principles too intimately combined with the water to escape.

Though the saltness of the sea considerably aids in preserving it from putrefaction, it is not alone sufficient for that purpose, and without the constant motion produced by winds, tides, and currents, it would in a short time corrupt, as has

been frequently experienced in long calms within the tropics.

The only method of freeing sea-water from its salt, is by distillation; but this process is so tedious and requires such a quantity of fuel, that it can scarcely ever be carried to sufficient extent to supply the total want of fresh water at sea, though it may considerably protract the arrival of so dreadful a calamity; besides distillation does not entirely deprive the sea-water of its bitter taste when it contains sal ammoniac. This bitterness which renders sea-water so nauseous, is found to decrease with the depth,* whence it probably proceeds from animal and vegetable matter in a state of decomposition near the surface.

The general colour of the sea in the open ocean is a deep greenish blue: the latter tint, which is predominant, seems to proceed from the same cause that gives an azure colour to the atmosphere, and a deeper blue to distant mountains; for the blue rays being the most refrangible, are reflected in greatest quantity by the aquatic fluid, which, by reason of its density and depth, causes them to undergo a strong refraction. The other shades which have been observed in the waters of different seas, seem to depend on local causes, and often perhaps on optical illusion; thus the water of the Levant is said at times to have a purple tint,

* Dr. Sparman found that sea-water taken from the depth of sixty fathoms, had the taste of fresh water in which common salt had been dissolved, and on an analysis it was found to contain an extremely small proportion of magnesia.

the sea in the Gulf of Guinea to be whitish, and near the Maldiva Islands black. The water of the Gulf of California is reddish, whence its name Vermilion Sea. The changes of colour in proceeding from the British Sea to the Frozen Ocean have been noticed by several voyagers; in the first it is the common greenish blue, in the sea of Norway a clear deep blue, and in the Frozen Ocean a deep black. The approach to the coasts of the continents, or of large islands, is generally denoted by the lighter green or yellowish tint of the water denoting being in soundings.

The southern seas present at times a phenomenon which terrified their early navigators, who seeing large spaces of the sea of a blood colour, conceived it a portent of some dreadful catastrophe; this appearance, however, seems to be generally produced by a multitude of sea insects of a red colour.(F)

Luminous Appearance.

The luminous appearance of the sea at night is a magnificent and imposing spectacle even to those habituated to observe it. When gently agitated, innumerable sparkles of light, some of a dazzling brilliancy, others of a silvery white, group themselves in a thousand forms; but when disturbed the appearance is more tumultuously grand, waves of fire rising, rolling onward and breaking in brilliant foam. This phenomenon has occupied the attention of many naturalists, some ascribing it solely to animals of the Zoophite and Mollusca classes, all of which they say possess phosphorus in a greater or less degree; others, while they admit

and the existence of luminous sea insects, are of opinion that the light of the sea is more particularly caused by animal and vegetable substances, which in the process of putrefaction discharge their phosphorus. Sir Isaac Newton was inclined to attribute it to friction alone, from the observation that the light is more brilliant when the sea is most agitated; others again, from particular experiments, conceive that it may proceed, at least in part, from a matter contained in the sea-water which has a direct analogy with electricity; finally, it has been supposed that the spawn of fish has a considerable share in this phenomenon. The recent observations of experienced naturalists, however, no longer leave any doubt as to luminous animals being the only cause that can be admitted as general.(G)

Temperature.

The observations made on the temperature of the sea afford the following general results. 1st. That the sun's rays only penetrate to the depth of forty-five, or according to some of one hundred and thirteen fathoms, below which the sea receives no light, and consequently little or no direct heat from the sun; hence it is inferred that the temperature of the bottom must follow that of the interior of the globe in the different latitudes. 2d. That the temperature of the sea at the surface differs from that of the atmosphere plus or minus, according to the circumstances of locality, season, weather, time of the day, &c. And 3d. That the temperature decreases with the depth to a certain degree, but never to freezing, which is

prevented

prevented by the constant internal heat of the earth.[B]

Oceanic ice. It was long doubted whether sea-water would freeze, and this doubt was strengthened by the experience of navigators, who found that the ice taken up from the ocean when thawed produced perfectly fresh water: hence Buffon supposed it to be formed in rivers by whose currents it was carried into the ocean. Captain Cook on the contrary ascribed its origin to snow, which being more solid and at the same time lighter, bulk for bulk, than the sea-water, would float on the surface and be converted into ice, which must continually augment in thickness from other snow, rain, &c. It is now, however, proved that it requires no very extraordinary degree of cold to freeze water more impregnated with salt than that of the ocean, and that it gets rid of its salt in the process of congelation.[I]

Oceanic ices are generally met with in lower latitudes of the southern than of the northern hemisphere, for the northern polar sea being almost surrounded by land which opposes the free drift of the ices, it is only the pieces formed in the bays and rivers of America that are carried by the polar current to the south, and such are occasionally met with on the west side of the Atlantic, so low as the latitude of 40°. On the contrary, the Greenland ships who keep along the coast of Europe, where is a constant current from the south, seldom meet with ice till they arrive at the latitude of 76°, and they are usually enabled to advance

advance to the latitude of 80° or even of 82°, before their progress is finally stopped by connected field ice. Between Asia and America, Captain Cook found the continents joined by ice in 70°, and his farthest progress was only 70° 48'.

In the southern seas there being no obstacle from lands to the drifting of the ices, they are often met with in large masses in latitude 40°. In 60° the ice islands are so numerous as to render navigation extremely perillous, and connected field ice usually entirely arrests it in 70°. In this ocean Captain Cook was unable to approach the pole nearer than 71° 10'. This navigator also describes the ice islands of the southern seas as of much greater extent and elevation, than those he ever met with in the northern.(K)

It is observed that the atmosphere is warmer where ice islands are first met with, than in the immediate lower latitude previously passed through, which seems to proceed from the ice reflecting the sun's rays, and also that the temperature is greater near these masses in the regions of their formation, than when having drifted into lower latitudes they are thawing, which is evidently caused by the progress of fusion; for ice being formed by the deprivation of caloric, its fusion can only be produced by a new combination of the same element, which it absorbs from the atmosphere, and renders it extremely cold. The approach to ice islands is denoted, even in the darkest night, by a whitish light which they reflect in the horizon, and which seamen call the blink.

A celebrated writer has supposed that the poles are surrounded by vast cupolas of ice, which by their diurnal fusion produce the phenomena of tides; but this hypothesis is unable to bear the test of examination, and even the existance of such cupolas is more than doubtful. Indeed, it is thought by many naturalists, that there is less ice immediately under the poles than some distance from them; but in objection to this idea it may be observed, that from the winds decreasing in strength in approaching the pole, it is not improbable but a perfect calm reigns at the pole itself: hence, if we reasoned from analogy, we should conclude that the region under the pole must be eternally frozen; for it is observed by those who have ascended the highest mountains, that the winds decrease in strength as they approach the glaciers, and that at the elevation of eternal frost it is constantly calm.

The annual fusion of the polar ices, it is evident, must counterbalance their annual increase, or otherwise their continual accumulation would in time produce a total revolution in the temperature of the earth; but the short and feeble summer that visits these desolate regions is certainly not sufficient to counteract the long and rigorous winters to which they are doomed. Captain Cook thought that "it is the wind, or rather the waves raised by the wind, that bring down the bulk of these enormous masses, by grinding one piece against another, and by undermining and washing away those parts that lie exposed to the surge of

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the sea: thus it may happen that more ice is destroyed in one stormy season than is formed in several winters, and an endless accumulation is prevented." The action of the waves, or the friction of the masses of ice against each other, seem however to us to be insufficient to prevent this accumulation, and we are more inclined to admit as a general cause the constant heat of the earth, and the higher temperature of the sea than of the atmosphere in these regions: hence the bases of the glaciers, or ice islands, in contact with the earth, or floating in the sea, are constantly exposed to a temperature sufficient to cause their fusion, and thus as they accumulate above they decrease beneath.

The superior degree of cold of the southern hemisphere than of the northern, in equal latitudes, is now generally ascribed to the greater extension of the southern ices towards the temperate zone. The absence of any considerable land in the high southern seas, and the form of the continents, which terminate in angular points, leave a free course to the polar currents, and permit them, as we have already observed, to convey the ices of the pole far into the temperate zone, where their presence causes those sudden transitions from heat to cold, and those intense fogs, met with by navigators in the great southern ocean.(L)

Springs of fresh water in the sea.

In several places near the shores of the sea springs of fresh water are observed, rising to the surface, and refusing to combine with the salt water

water that surrounds them. The most remarkable instances of these phenomena are in the Gulf of Spezia; in the Persian Gulf, near the isles of Bahrein; and in the bay of Xagua, on the south coast of Cuba. It may be presumed that veins of water, finding no outlet towards the surface of the land, follow the direction of internal fissures even under the sea, until they meet with such an outlet, through which they naturally ascend, with a force in proportion to the elevation of their sources and the declivities of the subterraneous canals, in the same manner as spouting springs on the land.

Movement of the ocean.

Although the density and gravity of the waters of the ocean combine to retain them in equilibrium, or to preserve their general level, they nevertheless cede to very slight impulsions, and are constantly agitated by three different movements: 1. The undulatory movement, or waves; 2. The siderial movement, or tides; and 3. Currents.

Waves.

The movement of the atmosphere or winds produce correspondent movements on the surface of the ocean, which increase in rapidity and violence with the velocity and force of the winds: thus a moderate breeze produces a gentle undulation, which moving slowly onwards, exhausts itself and subsides tranquilly. In a storm the ocean is furrowed by tremendous waves or mountainous ridges of water, each of which rolls on with furious rapidity, until its summit arrives at an overcharging elevation, from which it necessarily precipitates itself by the force of gravity, and by the acceleration it has acquired in its descent, impels forward the mass

mass of water immediately before it, which in its turn rises, forms a wave, and pushes forward the water before it, and thus is a continual succession of waves generated. Dr. Woolaston, secretary to the Royal Society, found the velocity of the waves to be nearly sixty miles an hour close to the east coast of England. It seems of necessity that their comparative velocity must be greater in the open ocean than near the shores in shoal water, where the mixed particles of sand and mud increasing the density of the fluid, as well as the friction on the bottom, must considerably retard their progress.*

To that state of the ocean after a storm, when mountainous and long billows follow each other slowly and subside without breaking, seamen give the name of swell,† while high breaking waves are called a sea. After a storm, if a wind springs up in an opposite direction, the waves it creates being contrary to the *swell*, what is called a cross sea is produced, often more dangerous than the most mountainous but regular waves. A swell is often experienced in a contrary direction to the wind blowing at the moment, and is a certain prognostic of a change of wind to the direction of the swell, the latter sometimes preceding the former several hours. The extraordinary long swell always met with near the equator, seems to be

* Horsburgh's India Directory.

† The direction of the swell is like that of the wind, named from the point of the horizon *from* which it proceeds.

be caused by the more direct and powerful influence of the sun and moon on this part of the ocean, by which it is necessarily more agitated than nearer the poles, where the action of the heavenly bodies is indirect; besides, the equatorial region performing its diurnal revolution with greater velocity, and at the same time tracing a larger circle than any other portion of the globe, its waters must be more agitated by the centrifugal force, which depriving them of a portion of their gravity, renders them more susceptible of external impressions. It is doubtful to what depth the sea is agitated by the winds: twenty fathoms seem to be the farthest to which divers have descended, and at this depth they have found the water so troubled, that mud and shells were carried to considerable distances; while other divers pretend that at the depth of fifteen fathoms they have found the water perfectly tranquil even in the greatest storms.

Surf. The breaking of the waves on a flat shore is named a surf, and is a curious phenomenon, worthy of particular notice. The surf, says Marsden,* is at times composed of but one rank of waves along the shore, at other times there are two, three, four, and even more, one behind the other, extending half a mile from the shore. The surf begins to take its form at some distance from the place where it breaks, and augments by degrees as it advances, until it arrives at the com-

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* History of Sumatra.

new height of fifteen to twenty feet, from the summit of which elevation the wave precipitates itself like a cascade from a precipice, with a noise that may be heard at several miles distance, and which often in the night gives the navigator sufficient notice of his danger to enable him to escape shipwreck, on shores where there would be no human possibility of saving his life.

Although from the first formation of the surf the water seems to have a rapid progressive motion towards the land, yet a light object floating on it, instead of being carried on shore drifts parallel to it if the tide is flowing, and drives off if it is ebbing; whence it seems probable that the movement is propagated in the fluid alone as sound is in the air, and that the mass of the wave is not propelled forward, the only real progressive movement being produced by the perpendicular fall at the moment of the breaking of the surf, when the wave, by its descending weight, spreads itself in foam to a greater or less distance, in proportion to its elevation and to the declivity of the shore.

Though the wind produces the wave which is to form the surf, it is certain that the wind is not the immediate cause of the surf itself, for it is often greatest in a calm, and least in a storm, and is also often most violent when the wind blows off the shore. Marsden supposes that when the wave approaches a shore whose depth is not in proportion to its volume, this wave, instead of pressing on a mass of water which would elevate itself to an

equal height and form another wave, presses on the ground, the reaction of which forces it to precipitate itself as we have described. The greatest surfs are observed between the tropics, and particularly on the coasts of Africa, on that of Coromandel, and the west coast of Sumatra.

Tides. Tides are periodical oscillations of the sea, caused by the attractions of the sun and moon, and more particularly of the latter, whose action we shall therefore chiefly consider, supposing her to be in the plane of the equator.

It is evident that if the moon acted on all the molecules of the sea by an equal attraction parallel to the centre of gravity of the earth, the earth and the waters of the ocean would have but one common movement, and their relative equilibrium would suffer no alteration; this equilibrium is in fact only deranged by the different intensity of the moon's attractions, and the different directions of these attractions. Some parts of the earth are directly attracted by the moon, and others obliquely: the former are said to be in conjunction, that is, a line drawn through the centres of the two planets would pass through their zeniths; the latter are said to be in quadrature, or a line drawn from the centre to the zenith of one planet would form an angle of 90° with a line drawn through the centres of the two planets; but the attraction which thus acts obliquely is of consequence weaker than that which acts directly, or, in other words, the parts of the earth in conjunction are more powerfully attracted than those in quadrature, and hence the

the gravity of the molecules of the former being diminished, it follows, that in order to preserve the equilibrium in all parts of the ocean, the waters of the parts of the earth in conjunction must elevate themselves, so that the greater gravity of the molecules in quadrature shall be compensated by the greater height of those in conjunction.

The waters rise not only on the side of the earth presented to the moon, or in conjunction, but also on the opposite side; because, if the planet attracts the superior waters more strongly than it does the centre of the earth, it at the same time attracts this centre more forcibly than it does the inferior waters in the opposite hemisphere; these latter waters will therefore remain behind the earth's centre, in the same proportion that the superior waters elevate themselves towards the planet.

Thus there will be formed by the moon's attraction two eminences of water on the opposite sides of the earth, which will give the ocean the figure of a lengthened spheroid, of which the great axis will pass through the centres of the moon and earth; it will therefore be high water at the same time under the moon, and at the opposite point of the earth, one hundred and eighty degrees distant; and it follows, that in the two intermediate points, or ninety degrees distant from the moon, it will be low water at the same time.

The earth by its rotation on its axis, presents to the moon every twenty-four hours all its meridians, each of which is consequently, at intervals of six hours, either in conjunction or in quadrature;

hence it results, that in the space of time between the departure of the moon from one meridian and its next return to it, that is in the space of a lunar day, the waters of the ocean must be elevated and depressed twice in all parts of the globe, although in an almost insensible manner in those places most distant from the moon's course. By the same diurnal rotation the earth carries with it to the east of the moon, the elevations of water thus produced, and which elevations will continue to increase for some time, from the continuance of the moon's action; for though the forces of this action diminish every moment they still subsist, and continue to combat the inertia of the waters; and hence it is that the tide is not at its greatest height at the moment the moon passes the meridian, but about three hours after. A secondary cause also assists in producing this retardation of high water; the waters in quadrature to the west of the moon, and carried towards conjunction by the rotation of the earth, are continually accelerated in this part of their progress, or move after the conjunction with a continually increased velocity, but meeting molecules continually more retarded than the earth, two opposite currents are formed, which place the greatest elevation of the waters about 45° distance from, or three hours after conjunction. For the same reasons the greatest depressions of the waters does not happen at the moment of the quadrature, but three hours after.

Supposing the sun to be on the plane of the equator, it is evident that his attraction must produce

duce on the waters of the ocean similar effects to those caused by the moon; but from his immense distance, these solar tides must be much smaller than the lunar ones, for according to astronomers, the moon's attraction with respect to the earth is near three times greater than that of the sun.

From the inequality of the solar and lunar days, * the actions of the sun and moon will sometimes be combined, while at others they will counteract each other; thus in the conjunctions, the actions of both unite in elevating the waters, and hence the highest or spring tides happen at new and full moon, nevertheless the highest spring tide does not happen on the day of the full or change, but two or three days after, because the movement produced in the waters by the attraction of the sun, does not cease suddenly, though its force is diminished. In the quarterings of the moon, the waters are depressed by the action of the sun, at the same time that they are elevated by that of the moon, and hence the lowest or neap tides happen about the first and last quarters.

What we have hitherto said regards the action of the moon and sun in the equator only; but if we consider them in their various declinations, we shall find the elevations of the waters vary in an inverse ratio to the cubes of their distances from these celestial bodies. It seems also to be the proximity of these bodies, which produces the high tides that usually happen before the vernal

* The lunar day is greater than the solar by about 50¼ minutes.

and after the autumnal equinoxes, that is, when the sun in his course through the southern signs is nearest to us. These high equinoctial tides do not, however, arrive every year at precisely the same times, variations being sometimes occasioned by the situation of the moon's orbit, and by the distance of time of the conjunction from the equinoxes.

Between the tropics, when uninfluenced by any local circumstances, the tides flow from the east with the movement of the celestial bodies. In the northern temperate zone, they flow from the south, and in the southern temperate zone from the north, that is in both from the equator, where the power of these bodies is most forcibly exerted on the waters. In the northern Frozen Ocean, the tides are in general very weak, owing to its distance from the centre of the siderial attraction, from the lands which surround it, and from the ices with which it is encumbered. Of the tides in the southern Frozen Ocean we have little or no knowledge.

The irregularities of the bottom of the ocean, the position of coasts, their declivity under water, the different breadths of channels and straits, winds, currents, and other local and temporary causes, destroy the regularity of tides, and by varying the degree of friction of the waters, shorten or prolong the duration of the ebb and flood.* Thus

* In most places of the globe, the tide flows twice in twenty-four hours, according to the principles of the siderial attraction; there are, however, a number

Thus among the scattered islands of the tropics the tides are regular, but the rise is inconsiderable; while on the oceanic coasts of Europe, and on the east coast of Asia, they are extremely strong, and subject to many irregularities. The highest tides, yet observed, are in the Gulf of St. Malo, on the coast of France, where the flood, driven back by the coast of England, accumulates and rises to the height of seven and eight fathoms. It is difficult to give credit to the accounts of the travellers who inform us, that, in 1692, the Island of Formosa experienced a tide that passed over the chain of mountains that traverses the island!

The absence of tides in some mediterranean seas, instead of being an objection to the theory of sidereal attractions, is a proof in its favour; for, in small quantities of water, the moon acts at the same moment on all parts, and diminishes the gravity of the whole mass; but there being little or no neighbouring water to move forward and increase the liquid elevation, which is produced less by a vertical elevation of the waters attracted, than by a lateral flowing of the neighbouring waters, by virtue of their greater density, consequently there can be but little or no tides in those mediterraneans whose entrances face the west, or in a direction opposite to the general movement of the oceanic tides.

number of exceptions, particularly among the Asiatic islands within the tropics, as well as on the coast of Van Diemen's Land, where there is but one tide of flood in twenty-four hours, and in those places the passage of the moon over the meridian usually makes high water.—Horsburgh. Ind. Direct.

Among pilots it is customary to reckon the time of high water, by the point of the compass the moon bears on at that time, allowing three quarters of an hour for each point: thus in places where it is high water at noon, the tide is said to flow north and south, or twelve o'clock; if she bears S. E. at high water, it is said to flow S. E. and N. W., or nine o'clock; and if she bears S. W. it is said to flow S. W. and N. E., or three o'clock; and so on for every point of the moon's bearing.(N)

Currents.

Currents are movements of the ocean produced by various causes, and may be divided into *general* and *particular*; the former depending on fixed and general causes, always preserve the same direction and limits, while the latter resulting from local and temporary ones vary in both. We shall here confine ourselves to the general currents, leaving the variable ones to be noticed in the particular descriptions of the seas in which they are observed.

General constant currents.

Between the latitudes of 30° in both hemispheres, a constant movement of the ocean is observed, which seems to convey its waters from east to west, or in a contrary direction to the rotation of the globe: by another movement the waters of the polar seas are conveyed towards the equator. The causes of these two general and constant currents are, the heat of the sun and the rotation of the globe.

The movements which convey the polar waters towards the equator, or the polar currents, are produced by the fusion of the ices, by which the polar seas have always a superabundance of dense water,

which

which they are continually discharging towards the equator to preserve the equilibrium of the ocean, deranged by the less specific gravity and greater evaporation of the waters of the torrid zone.

The grand movement of the ocean from east to west, or the *equatorial current*, has a more complicated origin; and the trade winds, so far from being the cause, as has been supposed by some, are probably in part the effect of this current. Buffon thought that the sun and moon advancing continually to the west, in regard to a fixed point on the earth, must draw the mass of waters after them, and occasion a constant movement of the ocean from east to west, but this explanation not being found satisfactory, the following has been offered. The heat of the sun and the rotation of the earth constantly tend to diminish the density of the equatorial waters, and evaporation draws from that region a much greater quantity of the fluid than is restored to it by rivers or meteors; hence, as we have observed, the waters of the polar regions move towards the equator to restore the equilibrium; but these polar waters are specifically heavier than the tropical waters, and besides their rotative movement is infinitely slower, but their inertia prevents them from getting suddenly rid of their original movement, and therefore they cannot follow with equal velocity the increased rapidity of the rotatory movement of the globe in the equatorial regions. Heavy and motionless, they fall at once into a sphere of the most active movement, but preserve for some time their original character,

and

and imprint it to a certain degree on the equatorial waters with which they mix. The solid part of the earth being thus continually propelled towards the east with greater rapidity than the waters can follow, these latter resting always behind, seem to move towards the west, or to recede from the western coasts of the continents; and, on the contrary, the eastern coasts advancing towards the waters, cause the latter to appear to advance towards them: hence it appears that this grand movement of the ocean is no more than a tranquil oscillation of the waters, depending on their invariable tendency to preserve their equilibrium.

Tropical current of the Atlantic.

In the Atlantic the tropical current from east to west is constantly felt between the latitudes of 30° N. and S. commencing at a certain distance from the coasts of Africa, and increasing in strength as we go westward; it is also more powerful near the equator from the more rapid rotation of the earth. As it approaches the coast of America, it is broken by the projecting elbow of Brasil into two currents, which follow the different directions of the coast.

Gulf stream.

The first of these broken currents runs to the N. W. along the coasts of Brasil and Terra Firma, and through the Caribbean Sea into the Gulf of Mexico; from which latter it rushes with great rapidity through the channels between Cuba and Florida, and between the latter and the Bahama Banks, forming what is called the gulf stream. It continues its direction along the coast of America to the N. E. till it reaches the south extremity of the

the Bank of Newfoundland, by which, and meeting with the polar current, its direction is changed to the east and southward of east. It has been pretended that the gulf stream retains sufficient force to extend itself to Cape Blanco on the coast of Africa; its limits are defined by the azure clearness of its waters, and by its temperature, which is considerably greater than that of the sea through which it runs.* To this current some ascribe the almost continual fogs that hover over the banks of Newfoundland, which they suppose to be caused by the strong evaporation of the stream.

Current the S. E. coast of America.

The second branch of the tropical current formed by the elbow of Brasil sets to the south, in the direction of the coast, and increases in strength with the latitude as far as the entrance of the Rio de la Plata, whose stream is so powerful as to produce a strong easterly current† that is felt one hundred leagues from the coast. To the south of this river the currents appear to lose their regularity, setting, according to the observations of different navigators, with considerable force from the north and south, as well as from the east and west. It appears, however, that a current sets *generally* through the Straits of Magellan from the east.

Current on the east side of the Atlantic.

On the south-eastern side of the Atlantic there is a constant current setting from the north, and following

* Dr. Blagden found the difference to be six degrees in the month of April, and in latitude 33°, longitude 76°, the temperature of the stream being 78°. Heriot, in his voyage to Canada, says, that near the Banks of Newfoundland the difference is from 15 to 20 degrees.

† Currents are named from the points of the horizon *towards* which they set.

following the directions of the coasts to Cape Lopez Gonzalves. This current, which we suppose to be the prolongation of the northern polar current, sets with considerable force into the Bay of Biscay, and through the Strait of Gibraltar into the Mediterranean: it continues a S. E. direction to Cape Blanco, in 20° N. where it changes to S. W. as far as Cape Roxo; here it curves round into the Gulf of Guinea, setting S. E. and east to Cape Lopez.* On the equator this easterly current appears to extend to the 20th degree of longitude; for, to the west of this meridian, the general tropical current is experienced. Ships who have crossed the line to the east of 20° have been so greatly affected by the former, that they have made the coast of Angola, when by their reckoning it was two hundred leagues distant; and, on the contrary, vessels which have crossed the line a few degrees to the westward of 20° have unexpectedly made the coast of America.

Tropical current of the Pacific.

In the Pacific, or Grand Equinoctial Ocean, the general tropical current from east to west is felt with such force, that near Cape Corientes, on the coast of Peru, the sea is described as seeming to fly from the land. It is to this current that must chiefly be ascribed the great errors in the estimated longitudes of the islands discovered in this ocean by the early navigators, and which have led more modern

* It may be assumed that the great heat of the atmosphere near the coast of Guinea diminishing the density of the waters; the cooler ones of the sea, at a distance from the land, flow towards the latter to restore the equilibrium, and thus produce an easterly current.

modern ones who have revisited them, to claim the honour of discovery.

In the Indian Sea a constant current sets along the west coast of New Holland, or Terra Australis, to the north, till obstructed by the Sunda Islands, its direction is changed to the N.W. This current seems to be the result of the pressure of the southern polar waters towards the equator. The Indian Sea being bound on the north by land within the tropic, there is no body of cold water in that direction, and consequently the equatorial current must be weak; while the general movement of the Pacific to the west being broken by a vast archipelago, does not extend its influence into the Indian Sea, therefore on the eastern part of the latter, the southern polar current meeting no counter action, extends itself in the direction of the coasts, even to the head of the Bay of Bengal. Currents of the Indian Sea.

But though the equinoctial current of the Indian Ocean is thus weak or null on the east, it gathers strength as we go westward, until meeting with the islands and banks between the south extremity of Malabar and Madagascar, they oblige it to change its direction to the south, outside of Madagascar, having passed which it strikes against the coast of Natal. Though the great mass of the waters of the Indian Sea thus take a direction to the south, a part of them still move on to the west, through the channels between the islands, till reaching the coast of Zanquebar * they follow its direction to the south,

* The force of this westerly current is so great that a ship in sailing from the Mozambique Channel to Bombay has been one thousand miles to the westward of her reckoning.

south, rush through the Mozambique Channel with great rapidity, giving its name to Cape Corientes; to the south of which their force is joined to that of the great mass of waters as above, and thus united they form the current that sets round the Cape of Good Hope with such velocity as enables ships to double this promontory even against the most violent contrary winds. It is the conflict of these winds and current that creates the heavy sea, which caused its first discoverers to give the name of the Cape of Torments to this extreme point of Africa.

The monsoons create superficial currents in the Indian Seas, which change with the seasons, the knowledge of which is essentially necessary to the advantageous navigation of these seas, and which we shall have occasion to notice hereafter.

Superior and inferior currents.

The existence of contrary superior and inferior currents, supposed by Halley and denied by Buffon, is still doubtful. Those who admit these opposite currents assign as the possible causes, the different densities of the waters at different depths, a great rapidity of movement towards the surface, and the cohesion of the molecules of fluids*.

Whirlpool.

When two opposite currents of equal force meet, they form a spiral vortex, or whirlpool, of which the most celebrated are the Maelström, on the coast of Norway, and Euripus, in the Strait of Negropont. Charybdis, in the Strait of Messina, has also been described, both by the ancients and moderns, as

* See Strait of Gibraltar, Sound, and Channel of Constantinople, in which these contrary currents are asserted to exist.

as a whirlpool, though it seems to be only a violent agitation of the waters at the surface by the meeting of the tides, and has no vortex. It was the phenomena of whirlpools that gave rise to the now exploded idea of abysses, which penetrating through vast masses of land formed subterranean communications between distant seas; such as between the sea of Norway and the Gulf of Bothnia by the Maelström, between the Persian Gulf and Caspian Sea, &c.(O)

Depth and velocity of currents.

The depth to which the ocean is agitated by currents is a problem that probably will never be resolved; but the regularity of the general currents seems to indicate their having a considerable depth. The velocity of these movements can be ascertained to a great degree of certainty, as well by trial as by the errors they cause in the estimated reckoning. The velocity of the tropical current in the middle of the Atlantic, seems to be from one to two miles an hour, while that which sets round the Cape of Good Hope, often runs at the rate of three to four miles.

Changes caused by the sea on the coasts.

Before we enter on the detail of the changes produced by the ocean on the coasts of the continents within the memory of history, we shall take a rapid glance at those which seem to have been operated by the same cause anterior to all historical records. If we set out from the 63° of north latitude, on the east side of the old continent, and follow its coasts to beyond the equator, we find them presenting a series of vast basins and gulfs penetrating into the continent, and enclosed within chains

chains of islands and banks, separated by narrow and winding channels. On the western side of the same continent we observe nothing similar. From the north Cape of Lapland to the Cape of Good Hope the coast presents a continuity unbroken, except by the mouths of rivers, and by the entrances of the Baltic and Mediterranean Seas; the formation of which are accounted for on different principles;[P] and with respect to the British islands, which form a mere point in this space, their separation from the continent was probably produced by a sudden convulsion of the earth, rather than by the gradual action of the waters.*

In following the eastern coasts of the New Continent from the latitude of 60° N. to within 10° of the equator, ruptures of the land and chains of islands and banks are presented to us similar to those we have observed on the east coasts of our own continent: thus Davis' Strait and Hudson's Bay answer to the Sea of Tartary, the Gulf of St. Lawrence to the Sea of Japan, while the West India Islands enclose the Gulf of Mexico and Caribbean Sea, as the Lieu-Kieu islands and the Malay Archipelago do the seas of Corea, of China, and of Sunda. No such appearances are observed on the western coast of America, which, with the exception of the Gulf of California, from Cape Horn

* The islands and rocks which line the coast of Lapland and Norway, and the numerous gulfs on these coasts, may also at first appear to constitute a deviation from these general observations, but these islands and gulfs seem to owe their origin to some grand convulsion of nature, either by a perpendicular sinking or elevation, and not to the gradual effect of the waters.

Horn to Cape Prince of Wales, presents a continued part of abrupt cliffs, immediately washed by the Grand Ocean.*

This broken state of the eastern coasts of the continents is ascribed by Buffon and other writers, to the constant movement of the Ocean from east to west, and this opinion is strengthened by the observation, that the coast of Asia is more broken than that of America, and that it ought to be so from the difference in the masses of waters of the two oceans, the Grand Ocean being at least three times broader than the Atlantic, consequently, allowing them the same lengths, and supposing their depths in proportion to their different breadths, the former has nine times the solid contents of the latter, and therefore must, their velocities being equal, act with nine times the power on the body of land that opposes it. Moreover the greatest effect ought to be produced near the equator, because it is there that the masses of the waters and the velocity of their constant movements are greatest, and accordingly it is between the tropics that the eastern coasts of both continents are most torn, and the greatest effect is manifested precisely where the breadth of the Ocean is greatest, that is in the Atlantic, between the parallels of 7° and 20° N. and in the grand Ocean, on the entire

* The Magellanic islands and the Archipelago of Chiloe on the south, and all the chain of islands on the N. W. coast of this Continent, being like those of the coasts of Lapland and Norway, mere masses of rock, separated from each other by very narrow channels, seem to owe their general formation to a similar cause.

space between the tropics; for it is at the equator itself that this Ocean has the greatest breadth.

The only difficulty in adopting the opinion of Buffon is, that the lapse of several centuries has scarcely rendered sensible the action of the sea on these coasts; but to this objection it may be replied, that the sea having washed away the lighter and less cohesive matter that primitively united the now detached lands to the continents, there remains only substances of so hard a nature that the efforts of the Ocean against them are almost powerless. It is also to be observed, in support of this hypothesis, that the coast of South America within the tropic, which is exposed to the continual action of the equatorial winds and currents, is lined by a chain of rocky banks which protect it from their violence, while the opposite coast of Africa is bordered by a beach of fine sand.

Formation of new lands.

But though the changes produced by the sea on the coasts since the period of history are insignificant in a great general point of view, they are nevertheless sufficient to demand particular notice. The sea forms new lands by the sand, shells, marine plants, and mud of rivers which it deposits on the margins of the shores, and also by retiring from some parts, in consequence of having encroached on others. The coasts of the Mediterranean have both gained and lost, so that it is probable the one compensates the other. The port of Alexandria on the coast of Egypt, grows every day shoaler; and Damietta, the walls of which were washed by the sea in the thirteenth century,

Changes on the coasts of the Mediterranean.

century, is at present considerably inland. These alterations, however, seem to be produced rather by the sand blown from the desert, than by materials thrown up by the sea; and to compensate them lake Menzaleh appears to have been formed, either by an irruption of the sea, or by a branch of the Nile, whose channel has been neglected.* On the coast of Syria the island of Tyre has been united to the continent, and on the west coast of Asia Minor the inhabitants of Miletus and Ephesus have several times been obliged to change the sites of their towns to follow the sea which receded from them. The valley through which the Meander now serpentizes, was evidently once a gulf, its soil consisting of the depositions of the sea and river. On the west coast of Greece many islets have been joined to the main, while the celebrated Peninsula of Leucadia has become an island. In the Adriatic the sea has encroached on the coasts of Dalmatia and Istria, and retired from those of Italy, so that the greater part of antient Lombardy has been formed by the combined depositions of the sea and the Po. Ravenna, which formerly had an excellent port and was surrounded by lakes and salt marshes, is now three miles from the sea, in the midst of gardens and meadows; Aquileа was also formerly on the mar-

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* Some of the Antients supposed that a great gulf once penetrated into Egypt as far as Thebes, by which the isle of Pharos was separated a day's navigation from the Terra Firma, but the existence of this gulf is unsupported by any historical or natural proof, and, with the few trifling alterations we have noticed, the coast of Egypt at this day answers to the earliest description by Herodotus.

gin of the sea, and finally the lagoons of Venice are daily filling up.

From the Mediterranean coasts of France and Spain the sea has retired in several places and gained on none; thus much new land has been formed at the mouths of the Rhone, and Aigues Mortes, which in the thirteenth century was a sea port, is now five miles inland. Miquelon and Psalmodi were islands in 815, though now two leagues from the sea, and the vineyards of Agde were covered by the sea only a century past. The coasts of Valencia and Catalonia have also considerably gained from the sea, and the port of Barcelona is fast filling up. From this series of facts it would appear, that the coasts of the Mediterranean have gained more than they have lost; but it must be considered that, with the exception of Egypt, we are unacquainted with the relative antient and modern state of the coast of Africa; and besides a number of celebrated ports preserve the same depths as in the time of the antients, such are Marseilles, Genoa, Syracuse, Navarin, &c. hence there seems to be no sufficient reason to suppose a diminution of the waters of the Mediterranean.

Changes on the coasts of the Atlantic.

The waters of the Atlantic by their depositions have formed the bases of the *landes*, or sandy downs that border the coast of France from Bayonne to Bordeaux, and by which several antient bays have been filled up. The marshes of la Vendée have also been left by the sea.

In the English Channel.

In the English Channel the bay on the coast of France,

France, in which is Mount St. Michael, grows shoaler, while near Dol the sea is again encroaching on the lands from which it had formerly retired. The sea has encroached on some of the coasts of England and retreated from others; thus the Goodwin sands are generally thought to have been formed by an irruption of the sea in 1100, while in later times several of the best harbours between the Thames and Beachy-head have been filled up. On the coast of Lincoln the sea seems to have alternately formed new lands and submerged them.

On the coast of Holland.

On the coast of Holland the most remarkable alterations and vicissitudes have been produced by the sea. In the earliest history of this country it is described as composed of immense marshes, alternately inundated by the sea and rivers, the first threw up sand on the shores, and the latter deposited mud on their banks, and thus elevated spots were formed, round which human industry raised embankments, thought capable of resisting the utmost fury of the ocean. The country however still remained intersected by lakes and rivers, which silently undermined these new formed lands, and the sea in high tides rushing up the rivers produced terrible inundations. Before 1250, the Zuyder Zee was a lake of middling size, which communicated with the British sea by the river Vlie; in that year an irruption of the sea gave it its present form and extent. Until 1300, the gulf of the Dollart was a rich plain; and in 1421, an united inundation of the sea and rivers formed

the Biesboch, by submerging 72 villages with 100,000 souls.

Changes on the coasts of Denmark.

The coasts of Holstein and Sleswick have alternately lost and gained by the action of the sea. In 1240 the territory of North Friezeland had an extent of 15 leagues east and west, and consisted of rich pastures and corn lands. An irruption of the sea destroyed this smiling appearance, swallowing up a considerable portion of the territory, and detaching the rest from the continent formed the island of Nordstrand, which at the commencement of the 15th century had still an extent of six to eight leagues, and was celebrated for its fertility and population. The sea still continuing to encroach on it, dikes were thrown up to arrest its progress, and the inhabitants, to the number of 8,000, thought themselves in perfect safety. In 1643, however, the sea penetrated by more than forty breaches in the dikes, swept away 1000 habitations and 6000 persons, and of the island left but two fragments above water and several submerged banks; even these small remains have been attacked by the merciless element, the dikes being considerably damaged in 1791 and 1793. On the other hand, the sea deposits on the shores of the mainland of these provinces a fat mud, which forms new lands, that by their great fertility, in a few years repay the considerable expence of embanking them. All the west and north coasts of Jutland appear to owe their formation to the sea, which by throwing up sand has made a connected coast of what was formerly

formerly probably a chain of islands. It is, at least, certain, that several gulfs, which, according to the annals of the north, afforded retreats to the Scandinavian pirates, have been thus filled up.

Changes in the Baltic.

The trifling alterations produced by the action of the waters on the coasts of the Baltic since the memory of history, seem to compensate each other and to be principally produced by currents.

On the eastern shores of the old continent we know that the sea retires from the east shore of the bay of Bengal and encroaches on the west, where it has washed away almost the whole of the antient city of Mahabilipur, some of the ruins of which, called by the English the seven pagodas, are still to be seen between Madras and Sadras. The sea has also encroached on the Malabar coast, where a part of the old city of Callicut is now under water. The whole coasts of the Red Sea, according to Niehbur, indicate the retreat of the waters. On a great part of the coasts of Cochin-China and Tonquin, are observed proofs of the recent retreat of the sea, while on some parts it has encroached, and obliged the inhabitants to remove their villages inland.

The changes operated on the coasts of the New Continent are little known to us; the new lands formed at the mouths of the Mississipi and Oronoka owe their origin to the alluvion of these rivers. On the western coast the sea is said to gain on the land, and Captain Vancouver observed appearances which indicated a considerable encroachment on the N. W. coast.

Diminution of the Ocean.

Having thus sketched the probable and certain changes produced by the action of the sea on the coasts of the continent, we are naturally brought to the consideration of a grand question, which long divided the most celebrated naturalists, and which is scarcely yet at rest: "*Are the waters of the ocean diminishing?*" Celsius, a learned Swede, towards the middle of the last century, revived the opinion held by some of the antients, respecting the gradual desiccation of the ocean, and published a memoir in which he supported the diminution of the waters from the first existence of our continents, and the continuance of that diminution, which from observations made on the coasts of the Baltic, he estimated at 54 inches in every hundred years. This hypothesis was favored by many learned naturalists of the north, among whom Linneus stood foremost, and on it founded a theory of the earth,(2) but it at the same time met with great opposition, and even the states of Sweden took a part in the dispute, the clergy anathematizing it as contrary to holy writ, and the citizens uniting with them, while the nobles and peasants more wisely remained neutral.

The arguments in favour of the diminution are founded on the shells and other remains of sea animals met with on the highest mountains; the filling up of antient ports and straits, and the anchors and remains of vessels found far from the sea, and at considerable heights above its present level.

The opposers reply that the two first of these facts ought to be referred to two very different periods,

periods, for that the remains of sea animals belong to an age anterior to the formation of the present continents, and consequently prior to the existence of the present ocean, while the changes produced by the sea on the coasts have generally been effected since the memory of history. With respect to the anchors and vessels they explain the fact by supposing them to be the monuments of inland navigations on lakes and rivers which no longer exist, or of the universal deluge, previous to which there existed other continents inhabited by men, and which disappeared in the grand catastrophe that brought our present continents out of the waters; hence say they it is presumable, that the antediluvians navigated over our present lands, and threw out their anchors in our mountains, which were then shoals covered by the Ocean. It is further observed by the opposers of the diminution, that the experience of twenty centuries handed down to us by historical record, proves that the ocean with respect to its total volume is perfectly stationary, the diminution by evaporation being exactly compensated by the supplies it receives from rains, rivers, &c. To this it may be replied, that the loss of the sea by evaporation, being compensated only by these supplies, whatever tends to decrease them must necessarily produce an absolute diminution of the ocean, but as the mountains decrease in height by the action of the elements, the vapours they arrest, and the condensation of which produces rains and rivers, must also be diminished. But what then, it may

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be asked, becomes of the water thus withdrawn from the ocean? is it absorbed by volcanoes or by vegetables, or does it rise in vapours to other spheres? These are questions which it is not given to science to resolve, nor are they the only insolvable ones on the subject of the immense ocean, the probable cradle of the universe, and of which it may possibly be also the grave.

The ocean as well as the earth nourishes a variety of plants to which are given the general denomination of fuci, and which are vulgarly known by the names of sea and rock weeds. Some species adhere to the rocks close to the bottom, while others rise from these rocks to the surface, over which they spread for considerable spaces; such is the fucus giganteus observed by Captain Cook in the Great Southern Ocean, near Terra del Fuego and Kerguelen's Land, which rising from a rocky bottom 24 fathom deep, spreads over the sea in such a manner, that its whole length is estimated at 60 fathoms, though the thickness is not greater than that of a man's thumb.

In the north Atlantic is a space extending between the latitudes of 20° and 40°, and between the longitudes of 25° and 40° W., which is at all seasons covered with a species of weed of a beautiful green colour,* whence the early Dutch navigators gave to this space of the ocean the name of Kroos Zee, Sea of Duck-Weed, and the Portuguese that of Mer de Sargaço. It was formerly generally believed that this weed was torn from the

* Fucus natans.

the Florida Reefs, and conveyed by the gulf stream to where it is met with, and hence it received the name of gulf weed; an accurate examination has however shewn this idea to be unfounded, and leads to the inference that it propagates in the sea, and vegetates floating.[h] Navigators have been lead from isolated facts to consider the meeting patches of rock-weed at sea, as a sign of the vicinity of land; this, however, is by no means a certain indication, such weeds being frequently met with at some hundreds of leagues from any land, and out of soundings.

It seems probable that the different regions of the ocean have their peculiar animals confined to them by the temperature of the waters and the species of food necessary to their existence. To commence with the lowest class, or Zoophites, they are in great measure so little known, and so difficult to class, that we cannot say if each region exclusively possesses such or such a species. The varieties of corals, called Madrepores, Millepores, Tubepores, &c. seem to exist in a state of vitality only in the tropical regions, and there we find them forming what may be justly named Coral Seas; such are the South Pacific Ocean, the region between the Coast of Malabar and the Island of Madagascar and the West Indian Seas.[i] The various species of Mollusca also appear to be confined to their respective regions, those of the torrid zone not being met with beyond the lowest limits of the temperate. The abysses of the ocean contain monsters of this class, of which we have still

still but a very imperfect knowledge. Polypuses and Hydras, several yards long, have been observed in the English Channel and in the Strait of Messina; nor is it unlikely that the famous sea snake of the Norwegian seas is an immense animal of this same class. There is also reason to suppose that the depths of the sea are inhabited by testaceous mollusca, which are never seen on the shores; such appear to be the cornes d'ammon and other species found in a petrified state in the bowels of the earth, and of which none have been hitherto met with on the shores, or fished up from the bottom of the sea.

The want of industry in fishes renders it probable that each region has its peculiar species, which never quit it; thus the various species of the cod (gadus), the herring, and the mackarel, are only found in the Northern Seas,[T] while the dolphins, albicores, bonetas, &c. are confined to the tropics, or a little beyond them, where they wage an unmerciful war against the flying fish, which is also confined to the torrid region.[U]

Cetaceous and oceanic amphibious animals being under the necessity of frequently respiring the atmospheric air, it is probable that their various species are confined to certain climates; thus the black whale of the Northern Frozen Ocean seldom appears in the temperate zone, while the spermaceti whale, which affords ambergrease, is scarcely ever seen out of the tropical seas.[V] The seals of the southern seas also differ from those of the north,

north, and the great sea lion of Kamtschatka from that of Greenland.(W)

Each grand maritime division of the globe has also its particular species of birds; the albatross and several of the petrel tribe, the penguin, &c. are only met with in the temperate or frozen zones, while the man of war and tropic bird never quit the equatorial regions.(X)

A recent geographer* gives the following proportion of dry land in the two hemispheres, separated by the equator, as the result of a calculation as exact as possible.

In the Northern Frozen Zone -	0,400
Temperate Zone	0,559
Northern Tropic	0,297
In the Northern Hemisphere -	1,256
In the Southern Frozen Zone -	0,000
Temperate Zone	0,075
Southern Tropic	0,312
In the Southern Hemisphere -	0,387

The naturalists of the middle of the last century, from this very unequal distribution of the land and water, inferred the existence of a southern continent, as absolutely necessary to counterbalance the mass of land in the northern hemisphere, and preserve the equilibrium of our planet. The researches of Captain Cook, however, completely

* Malte Brun. Précis de la Géog. universelle.

pletely overturned this theory, that great navigator leaving unexplored only a zone round the south pole of between five and six thousand square leagues, in which it is possible there may exist lands inaccessible to navigation, amongst eternal ices; but even supposing their existence, they would make but a very trifling alteration in the proportions of land in the two hemispheres.

According to the generally received opinion at present, the quantity of land which appears above the surface of the ocean is so inconsiderable, in proportion to the size of our planet, that the effects of its unequal distribution on the equilibrium can be little or nothing; it is also possible that the ocean round the south pole has less depth than that round the north, and that therefore the submarine beds of earth in the former counterbalance the dry lands of the latter.

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*Of Rivers.**

Although the theory of rivers may not strictly appertain to maritime geography, it is not entirely foreign to it, and therefore may with propriety claim a short notice. The surface of a river is seldom level from side to side, but, according to circumstances, the water in the middle is either more elevated or more depressed than near the banks. Thus when the velocity of the stream is increased by the melting of the snows or falls of rain,

* Buffon.

rain, if the direction of the current is straight, the middle of the river, where it is strongest, elevates itself, giving to the surface a convexity, the highest point of which is the middle of the stream, and is sometimes three feet greater than that of the water close to the banks. This effect is the necessary consequence of the greater rapidity of the stream in the middle of the river, which diminishing the density of the waters that form the current, the more torpid, and consequently denser waters near the banks remain more depressed. On the contrary, rivers within the influence of the tides, take a convex form during the flood, the water in the middle being more depressed than that near the banks; this is the consequence of the tide, which causes two contrary movements in the river, forcing the water, near the bank, upwards, while the stream in the middle runs downwards, and hence the whole mass of the river water being obliged to pass down through the middle, the waters of the sides descend towards this middle, in proportion as they are more or less elevated by the strength of the tide forcing them upwards.

Besides the counter or ascending side current, formed in rivers by the tide of flood, their waters have another movement, named eddy, caused by obstacles to the stream, such as projecting points of the banks, islands, bridges, &c. The general effect of these obstacles is to produce a kind of whirlpool or rapid circular movement of the water, sometimes dangerous to boats, particularly in the passage of bridges, for the velocity of the stream under

under the bridge being increased by the narrowing of the channel, the water that rushes through the arches striking violently against them, produces a reaction that causes a whirling movement, and forms by the centrifugal force a cylindrical cavity or vortex.

Persons constantly employed on rivers foresee an approaching fresh or inundation, by a peculiar movement of the waters, those at the bottom flowing with more rapidity than those at the surface. In certain respects, a river may be considered as a column of water in a tube, in which every movement of the fluid is communicated from end to end, and hence the weight and movement of the waters towards the upper part of the river will produce an increased movement in the inferior waters of the lower part some time before their volume arrives.

In inundations of rivers produced by freshes, from the beginning of the rise the velocity of the stream increases until the water has surmounted the banks, at which moment it begins to decrease, and hence it is that these inundations last for several days, for although there may arrive a less quantity of water after the commencement of the inundation, the latter will continue, because it depends more on the decrease of velocity than on the volume of waters, this diminution of velocity, by retarding the progress of the waters downwards, producing the same effect as if a greater volume had continued to arrive. The direction of the wind will also affect the height and duration of

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the inundation, for when the wind blows up the river, the velocity of the stream will be diminished, and consequently the inundation will be increased; but if the wind blows down, the velocity of the stream being increased, the elevation and duration of the inundation will be lessened. The principal rivers that have great periodical inundations, are, the Nile, the Senegal, the Euphrates, the Indus, the Ganges, the rivers of Pegu, of Siam and of Cambodia, the Amazons and Plata, and, in general, all the great rivers within the tropics, the cause of these inundations being the heavy periodical rains in the equatorial regions. In several of these large rivers a phenomenon is observed, caused by an extraordinary strong ascending tide repelling the current of the river, when the conflict produces a mountainous ridge of water, capable of sweeping ships from the strongest moorings, and still more dangerous to small vessels.

Many great rivers, whose currents run slow, form bars of sand across their mouths, as the Nile, the Senegal, &c. while others rush with such rapidity, and volume to the sea, that they freshen and discolour its waters for many leagues; such are the Danube, the Plata, &c.

The velocity of rivers does not augment in proportion to the declivity of their beds, according to the general theory of inclined planes, this velocity depending more on the weight and quantity of the anterior waters than on the declivity. Hence the stream of a river, whose bed has twice the

declivity of another, does not move with twice the velocity only, but with treble or quadruple that velocity, according to the volume of its waters; therefore when it is intended to give greater velocity to a river or canal, by deepening its bed, the greatest declivity should be near the head, diminishing almost to a cypher at its mouth, as is naturally the case near the mouths of large rivers, where, though the declivity of the bed is almost imperceptible, the velocity of the stream is increased by the accumulated weight of the anterior waters; nay more, a river may acquire so rapid a movement, as not only to retain its velocity across a considerable extent of perfectly level ground, but also to surmount an eminence without spreading much on either side.

The following has been estimated as the proportional courses of the great rivers of the globe.*

Europe.	Thames	1
	Rhine	5¼
	Danube	7
	Wolga	9½
Asia.	Indus	6¾
	Euphrates	8½
	Ganges	9½
	Burrampooter	9½
	Ava River	9½
Asia.	Jenissei	10
	Oby	10½
	Amour	11
	Lena	11½
	Hoanho	13½
	Kian Keu	15½
Africa.—Nile		12½
America.	Mississipi	8
	Amazons	15¾

Of

* Rennel's Memoir.

Of Winds, &c.

The atmosphere is, like the ocean, subject to movements, which, considered generally, depend on the same cause, the invariable tendency of all fluids to preserve an equilibrium: hence a change in the temperature of a column of air, the condensation of a part of the atmospheric gas into rain, congelation, or whatever else causes a void, a contraction, or dilatation, and which consequently breaks the equilibrium of the different parts of the atmosphere, necessarily produces a displacement of a mass of air or a wind. Causes of Winds.

The observations made on the velocity of wind afford the following results:* Velocity.

A light breeze travels ten feet in one second of time,

A moderate breeze	16
A fresh breeze	24
A strong breeze	35
A strong gale	48 to 54
A storm	60
A hurricane	120 to 150

Winds may properly be divided into constant or general, periodical, and variable. There are two constant and general movements of the atmosphere, similar to the constant currents of the Division.

 ocean;

* A Professor of the University of Petersburgh has invented an instrument, which he has named Anemometer, for ascertaining exactly the velocity of the wind.

ocean; the first is the general equatorial movement, which carries the air relatively to the earth to the west, and the other that which draws the air from the poles towards the equator.

Trade winds. The general equatorial winds* seem to be produced principally by the solar heat, which rarifies and elevates the air between the tropics, and the air thus rarified must either be dissipated in the heavens, or must move towards the poles in the upper region of the atmosphere; at the same time that a cold air must arrive from the poles through the inferior region to fill up the void. But the velocity which each molecule of air receives from the rotation of the earth must be less in proportion to its nearness to the poles, whence it results that the polar air advancing towards the equator, and for a time preserving its primitive movement, will move with less velocity than the corresponding parts of the earth, the objects on the surface of which must therefore strike against the atmospheric fluid with a force corresponding to the excess of their velocity,† and thereby experience a resistance to their movement of rotation. Thus to the observer, who thinks himself at rest, the air appears to move in a direction directly opposite to the rotation of the globe, or from east to west.

The

* Called trade winds by the English probably because those of the Atlantic conveyed the trade from Europe to America.—*Vents alizés* of the French.

† The simple effect of riding or running fast in a calm clearly explains this theory, the person moving faster than the atmosphere always feels a wind in his face.

The currents of polar air in approaching the tropics encountering the equatorial movement, a combined movement is the consequence, producing a N. E. wind in the northern tropic, and a S. E. in the southern. These trade winds extend on the eastern side of the Atlantic between the parallels of 28° N. and 23° S. increasing their limits as they go westward, being met some degrees farther north and south near the coast of America. Their limits also vary with the season, extending farther beyond the tropics in the respective summers of the two hemispheres. The N. E. trade is usually lost between 12° and 2° N. and never crosses the equator, while the S. E. particularly in the northern summer season, is often met with in 5° N.(x) This extension of the S. E. trade to the north is probably dependant on the superior cold of the southern hemisphere, whence a more considerable current of dense air rushes towards the equator. The strength of the respective trades is greatest in the summer of the opposite hemisphere, which is the necessary consequence of the greater rarefaction of the air in this latter; it is also observed that the strength increases in going to the west, which seems to be partly the effect of the increased velocity of the equatorial current of the ocean, the movement of which must be considered as affecting the current of air over it, and partly caused by the proximity of the heated land, which draws towards it with accelerated movement the denser air of the sea. The directions of the trades also deviate towards the north and south with the sea-

In the Atlantic.

son, blowing more directly towards the region of greatest rarefaction; thus, while the sun is in the southern tropic, the N. E. trade inclines more northerly, even to the N. N. E.; and when in the northern, the S. E. trade inclines in like manner towards the south, even to the S. S. E.

It is from the knowledge of the trade winds that ships, bound from Europe to the West Indies, first steer to the south till they meet them; but in proportion as they are favourable to those bound to the western hemisphere, they are against those returning from it: hence it is the object of these last to get as soon as possible to the north of their limit into variable winds.

Deviations on the coast of Africa.

We have seen currents of the ocean, contrary to its general movement, setting towards the coast of Africa; a similar deviation is observed with respect to the winds near this coast: thus, north and N. W. winds blow in the vicinity of Cape Verd, and between it and Sierra Leone; and south and S. W. winds prevail on the coast of Guinea throughout the year, particularly between Cape Palmas and Cape Lopez. These winds are doubtless the combined effects of the currents and of the heated atmosphere over the burning deserts of Africa. It is in consequence of these south and S. W. winds that ships, bound from Europe into the Gulf of Guinea, usually prefer what is called the great or outer passage, as more certain than the inner one. In the former the course is the same as if bound to the East Indies until they have reached the twenty-eighth or thirtieth degree of latitude, when

when they steer for the coast of Africa; in the inner passage they keep close along the coast from Cape Verd, to take advantage of the land and sea breezes and southerly currents.

Sea of rains.

The space of the North Atlantic included between the parallels of 10° and 4° north, and between the meridians of Cape Verd and the eastern of the Cape Verd Islands, has been called the sea of rains. It is generally described as subject to very long calms, accompanied by a suffocating heat, with transient squalls of thunder, lightning and violent rains. Though these effects seem to have been considerably exaggerated, they nevertheless exist to a certain degree; and are probably produced by the two trade winds having spent their force when they reach this limit, and long calms are the consequence, while the vapours conveyed by both winds, ceasing to be impelled onwards, condense into heavy rains.

Trade winds in the Pacific.

In the Pacific Ocean the general trade winds are similar to those of the Atlantic, blowing constantly between the north and east in the northern tropic, and between the south and east in the southern. Near the west coast of America their limits are strictly confined to the tropics, or even within them, but they widen as they move onwards, extending on the coast of Asia to the latitude 32° N. and on that of New Holland, or Terra Australis, to about 30° S. With the N. E. trade, and the equatorial current, the Spanish galleons from Acapulco to the Philippines crossed the grand ocean in an undeviating track between the

By the time the sun in its retrogradation towards the south has again crossed the equator, the mass of air over Asia has lost the preponderant heat it had acquired during summer, and consequently precipitates itself towards the equator, producing a N. E. monsoon over the greater part of the Indian Seas, because the elevation of central Asia is to the N. E.; while in the China Sea the monsoon usually blows more northerly, the elevation being to the north and N. W.

The N. W. monsoon, south of the equator, is more difficult to be accounted for; it is possible that the N. E. monsoon meeting with the remains of the S. W. monsoon south of the line, their shock produces a compound movement or N. W. wind. It is easy to conceive that the duration of the S. W. monsoon is greatest towards its southern limits, where it is prolonged by the mountains of Africa and Madagascar, whose dense air must be constantly flowing towards the equator. The N. W. monsoon may also be accounted for by the existance of inferior and superior currents of air; an hypothesis which seems to be proved by the general fact, that in quitting the region of a monsoon a wind in an opposite direction is commonly met with, often blowing with great violence.

The monsoons create those alternate changes of weather on the coast of the Indian Seas, to which Europeans usually give the names of summer and winter, but which may with more propriety be termed the dry and rainy seasons. Of these, as well

well as of the local variations of the monsoons, we shall have occasion to take notice in the description of the Indian Seas.

Beyond the limits of the general winds, to the north and south, the winds are variable, but westerly ones prevail, and are most constant in high latitudes. The prevalence of these winds is ascribed to the constant alternate circulation of the atmosphere of the equatorial regions and of the poles; thus the rarefied air of the tropics moving in the superior region of the atmosphere towards the poles, and becoming condensed as it approaches them, again descends into the inferior regions, and blows from west to east to fill up the void left by the trade winds. The different positions of the sun in his annual course cause considerable modifications of these winds; thus, when he is traversing the northern tropic, the atmosphere of our hemisphere being proportionably dilated from the equator to the pole, a current of polar air will flow towards the equator, which modifying the westerly wind, N. W. and N. N. W. winds prevail in April, May and June. The sun when arrived at our summer solstice, having greatly heated the whole atmosphere of the northern hemisphere, the now colder air of the southern regions moves towards the north, producing S. W. and S. S. W. winds in July and August; but when the sun has again crossed the line, and advances into the southern tropic, the northern hemisphere loses its heat, and hence N. W. winds return in September, and become stronger and more constant as the sun recedes

Variable winds.

cedes from us. The same principles are applicable to the southern hemisphere, in which, beyond the limit of the trade, the westerly winds in the summer incline to the north, and in the winter to the south.

Influence of the moon.

The position of the moon may also influence the winds, and produce a flux and reflux in the atmosphere as well as in the ocean. But it can scarcely be the immediate attraction of this planet on so subtle a fluid that causes these atmospheric tides; on the contrary, it is probably the ocean that reacts on the atmosphere; and indeed it is certain that the movements of the former produce correspondent movements in the latter.

Other causes of variable winds.

The inequalities on the surface of the earth, and the nature of the soil, greatly influence the atmosphere, producing condensations and dilatations. Chains of mountains, by arresting currents of air in the lower atmosphere, as well as straits and gulfs, change their directions and increase their violence; in the same manner as the currents of the ocean acquire greater force in narrow channels and near promontories. Vegetation by the absorption of air, clouds by intercepting the sun's rays, evaporation and rain by their cooling properties, the decomposition of animal and vegetable matter by increasing the temperature of the atmosphere, all contribute to the formation of local winds.

Land and sea breezes.

Land and sea breezes, though most regular in the torrid zone, are also experienced in high latitudes, particularly in summer. As general winds are produced by the direct influence of the sun on

in the atmosphere, these alternate breezes are caused by his reflected heat from the land and sea. The surface of the earth, owing to its density and state of rest, is more suddenly heated by the sun's rays than the sea, and, consequently, it reflects this heat sooner and with greater force; but this density, at the same time, causes its heat to be more superficial than that of the sea, into which the sun's rays penetrate more deeply by reason of its transparency, and from continually presenting a fresh surface. Hence, towards noon, the earth has acquired and reflected on the atmosphere over it, a degree of heat which breaking the equilibrium, the denser air from the sea moves towards the land, and the same cause continuing to operate while the sun is above the horizon, a sea breeze will blow during that time. After sunset, as the earth loses its heat, this breeze dies away gradually, until the temperature of the atmosphere over the land and sea becoming equal, a calm is the consequence. The heat acquired by the sea during the day, not so intense, but more deeply imbibed, and, consequently, more durable, now acts in its turn, and producing a preponderant rarefaction in the atmosphere over it, draws the denser air from the land, which continues to flow back, producing a land wind, till the return of the sun again heating the earth causes it to die away into a calm, and again produces the sea breeze.

The sea breeze, in conformity to this theory, does not commence at a distance from the shore,

but

but close to it, and extends into the offing as the day advances, so that at its beginning, it is common for a ship two or three leagues off shore to be entirely becalmed, while another within a league of it, has a fresh sea breeze. The distance from the shore to which these alternate breezes extend, varies according to the heat of the day, but in general does not exceed six or seven leagues.* In the islands of the Pacific, even of the smallest extent, when the trade winds are not so powerful as to dominate over these causes, the sea breeze blows from every part of the compass towards their centres, while the land wind blows from these centres to every point of the compass.

Squalls. Squalls are transitory gusts of wind caused by adjoining portions of the atmosphere becoming suddenly unequally rarefied or condensed, which is probably often effected by the mere intervention of opake clouds obstructing the equal diffusion of the sun's rays on the atmosphere. The thunder and lightning and heavy rain, however, which usually accompany squalls within the tropics, where they are by far most frequent, prove them to be principally caused by electricity. They are most common and of greatest violence in the vicinity of prominent head-lands, which seem to attract the electrical fluid in the same manner as pointed perpendicular objects in the atmosphere. The southernmost point of Ceylon, hence called Dondra

* On the Malabar coast, where these alternate winds are more regular than perhaps in any other part of the globe, their influence is felt twenty leagues from the land. Horsburgh's India Directory.

Dondra (thunder) head, the N. E. point of Sumatra, and the East end of Jamaica, are particularly noticed for the frequency and violence of these electrical squalls. The white squall is a phenomenon confined to the tropics and not electrical. Its formation or approach is not denoted by any appearance in the atmosphere, consequently it is the more dangerous to ships under sail, particularly as, though of short duration, its violence is generally very great. The only mark that accompanies it, is the white broken water on the surface of the sea, which is torn up by the force of the wind.*

Hurricanes.

Some tracks of the torrid zone are subject to periodical or irregular storms, the violence of which is more than double that of the greatest tempest ever experienced in the temperate zones: such are the hurricanes of the West Indies and Indian Sea, and the tyfoons of the China Sea. In the hurricane, the elements seem to combine for the destruction of nature; forked lightnings cross each other incessantly in every direction; the thunder roars without intermission; the rain precipitates itself in torrents; the sea, hove up from its bed, is driven with irresistible fury on the land, while the winds, blowing at once from every point of the horizon, sweep away whatever is above the surface of the earth, and even scoop out and transport large patches of the soil to considerable distances. These terrible destroyers are ascribed to

* Horsburgh's India Directory.

to electricity, for, according to naturalists, at the moment when the electrical matter combines the hydrogen and oxigen gasses, it is probable that the combustion of a consiberable quantity of hydrogen takes place, occasioning a sudden fall of rain or hail, by which a great void is created in the atmosphere, towards which the ambient air will precipitate itself from every direction. The tyfoon of the China Sea differs essentially from the hurricane, in not being *always* accompanied by rain and lightning, and in not blowing from all points of the compass at the same instant. It however blows from the four cardinal points in quick succession, usually beginning with the North, and shifting suddenly to the East or West, and then to the South to return to the North, the revolution being made in about twenty-four hours. Neither are these tempests confined like the hurricanes to a particular season of the year, being experienced in every month. The tornado of the Coast of Guinea is only a hard and long squall from the East or S. E. with thunder, lightning, and heavy rain.

In several parts of the globe winds of peculiar natures blow occasionally, and appear to derive their qualities from the soils of the countries in which they are generated: such are the Mistral Sirocco and Solano of the Mediterranean. The Kamsin of Egypt, the Harmattan of the Coast of Guinea, the Samoumor Samiel of Persia and Arabia, &c. all of which are more particularly noticed in the sequel.

Among

Among the atmospheric phenomena observed at sea, the water spout is that which most frequently attracts the seaman's attention in navigating between the tropics. The following description of it is principally transcribed from Horsburgh's valuable East India Directory, as being peculiarly accurate. Water Spout.

"When a water spout is observed forming at a small distance, a cone may be perceived to descend from a dense cloud in the form of a trumpet, with the small end downwards, at the same time the surface of the sea under it, ascends a little way in the form of steam or white vapour, from the center of which a small cone proceeding upwards unites with that which projected from the cloud, and then the water spout is completely formed; frequently, however, the efficient cause is not adequate for this purpose, and in that case after the water spout is partly formed, it soon proceeds to disperse.

"There is in the middle of the cone that forms the water spout, a white transparent tube or column, which gives it a very dangerous appearance when viewed at a distance, as it seems like a stream of water ascending, but when closely approached, the dangerous appearance partly vanishes. I have," continues Mr. Horsburgh, "passed close to several water spouts, and through the vortex of some that were forming, and was enabled to make the following observations.

"By an electrical force or ascending whirlwind

a circular motion is given to a small space of the surface of the sea, in which the water breaks, and runs round in a whirlpool with a velocity of three, four, or five knots. At the same time a considerable portion of the water in the whirlpool is separated from the surface in minute particles resembling smoke, with a hissing noise occasioned by the strength of the whirlwind, these particles continue to ascend with a spiral motion up to the impending cloud. In the centre of the whirlwind or water spout there is a vacuum in which none of the small particles of water ascend; and in this as well as around the edges of the water spout, large drops of rain descend; because in those places the power of the whirlwind not being sufficient to support the ascending minute particles, they consequently descend in the form of rain."

The whole column has the appearance of a hollow cylinder, or empty glass tube; the diameter of the base of the ascending column appears to the eye to be from fifty to eighty fathoms, but both cones decrease till at their point of union the diameter does not seem to exceed two or three feet. The column sometimes glides through the air when there is no perceptible wind, and several close to each other are often seen moving in different directions; when the cloud from which is suspended the upper cone, and the lower cone do not move with equal velocity, they first form a curve, and finally separate, when a noise is heard like that of a distant cascade. Flashes of lightning

ning sometimes dart from the cloud, particularly at the moment of separation, but no thunder is ever heard.

Water spouts are thought to be produced either by a whirlwind or by electricity. Two opposite winds meeting produce a whirlwind, by which the cloud that is between them is compressed into a conical form, and turns circularly with great rapidity. This rotation animates all the particles of the cloud with a centrifugal force, that causes them to fly off towards the exterior, and thereby produces a void round the axis of the cone. The water or any other matter immediately under this void, is drawn into it by the effect of gravity endeavouring to restore the equilibrium.

The water that falls from these spouts in the shape of rain, is perfectly fresh, which is accounted for by supposing that it undergoes a kind of natural distillation in the rarified air of the superior atmosphere. The quantity of water contained in one of those columns is certainly not more than sufficient to produce a violent shower, and consequently the danger to ships from the fall of water is entirely imaginary. There may, however, be considerable danger from the whirlwind that produces the phenomenon, and consequently it is prudent to be prepared for it. The idea that firing a cannon near a water-spout will break it, also appears to be ill founded, for it seems very improbable that the slight concussion thus produced in the air is sufficient to destroy the cohesive force of the whirlwind.

Water spouts are formed over the land as well as over the sea, and to these phenomena may be ascribed the circumstance of finding small fish in considerable quantities a long way inland, as well as the showers of red and yellow rain, which seem to be caused by the blossoms of vegetables or minute insects taken up by these aerial tubes.

Mirage.

Mirage, or the image of objects in the horizon, that have no existence, or are in a different position, is one of the most singular optical illusions. At sea it often produces the appearance of land rocks and shoals, and deceives the navigator into the certainty of their existence. The most celebrated and best described examples of this phenomenon are the Fata Morgana in the Strait of Sicily, and Gunilla's ears in the Gulf of Bothnia. They are generally attributed to peculiarly composed clouds.*

Aurora Borealis.

The Aurora borealis in the north, the Magellanic clouds in the south, and the zodiacal light between the tropics, are phenomena in the heavens, presented to the seaman navigating in these regions. The Aurora borealis is seldom visible in our climates, but becomes common above the 60° of latitude, and in Greenland, Iceland, and Lapland, it is sometimes seen to the south. It begins usually three or four hours after sunset, and is announced by a dark cloud, having nearly the shape

* The celebrated Flying Dutchman, off the Cape of Good Hope, well known to seamen, is probably an appearance of this nature.

shape of the segment of a circle, of which the horizon forms the chord. The circumference of the cloud is first bordered with a whitish light, which sometimes again gradually disappears, but more commonly the nebulous cloud first splits into luminous crevices, each of which emits flashes of light of a yellow, rose, purple, and green colour, a general movement at last agitates the whole northern sky, brilliant flashes of light cross each other, until by degrees a luminous crown is formed in the zenith, which seems to be the central point of all the movements of the luminous matter. After having covered for an hour or two almost the whole heavens, the phenomenon diminishes at first to the south, then to the west and east, and finishes by entirely disappearing in the north towards sunrise.

The explanation of this phenomenon by Libes is generally admitted as the most simple and probable. He supposes it to be produced by the electric fluid combining the azote and oxygen gasses, which are most abundant in the atmosphere of the polar regions, and he corroborates this hypothesis by experiment, having produced similar lights by the artificial combination of these fluids. The reason why a similar phenomenon is not observed in the temperate Zones, is, that their atmospheres being always rarified, contain a preponderate portion of hydrogen and oxygen gasses, which the electric fluid fixes in preference, and produces thunder and lightning, both of which are almost unknown in the polar regions, from

the absence of hydrogen. In the southern hemisphere, an Aurora Australis is sometimes observed in the direction of the pole, but infinitely fainter than the northern.

Zodiacal Light.

The Zodiacal Light is a phenomenon observed constantly under the equator, appearing after sunset as a stationary whitish brightness in the sky, and of a lenticular form, having its base turned towards the sun and its axis in the Zodiac. It was generally believed that this light was the atmosphere of the sun, until La Place observed that it was impossible the sun's atmosphere could have a lenticular form, or extend beyond the orbit of Mercury, while the zodiacal light appears to extend even beyond the orbit of the earth. But while this hypothesis has been thus disproved, no other has yet been offered to replace it.

Magellanic Clouds.

The Magellanic clouds are three whitish spots in the heavens, having the same apparent motion as the stars. Two are about eleven degrees from the south pole, and the third much farther. It is thought they are produced by a multitude of small stars, like the milky way.

Fire of St. Elmo.

The Fire of St. Elmo is an igneous meteor often seen at sea playing round the mast heads of ships. By ignorant and superstitious seamen it is considered as portentous of calamity, though in reality it is no more than the electric matter which naturally is attracted by and collects round any moving point in the heavens.

Though

Though the ancients were acquainted with magnetism, its cause still eludes the researches of the most profound philosophers, and all we are sure of is, that there exists some substance or power in nature which influences all terrestrial bodies, but acts most forcibly on the oxidulated iron ore, named loadstone, or magnet. Two pieces of this substance mutually attract each other by a certain point, and repel by another; and when their movement is unembarrassed, they constantly turn these two points towards the poles of the world. The loadstone also communicates this quality to bars of steel, so that such a bar or magnetic needle indicates by one of its points the north and the other the south. To the invention of the mariner's compass, arising from the knowledge of this polarity, it is that the modern art of navigation owes its rise and perfection, for without this instrument the timid seaman, instead of launching fearlessly into the ocean, would still creep timidly along the shores, in frail barks, susceptible of being hauled on shore for safety during the night, and the one half of the globe would probably have ever remained unknown to the other.(z) Magnetism.

The best attempt at explaining this phenomenon, seems that which supposes the earth to be a vast magnet, which exercises its power in all bodies more or less sensibly, and that it has two magnetic poles and a magnetic equator, different from those given to it by its figure and rotation, and the existence of which accounts for the de-

viations of the magnetic needle. The first of these deviations, or the variation of the compass, is that angle which the axis of the needle makes with the meridian, and is either easterly or westerly, and continually changing in quantity in all those places where it is at all considerable. At London, in 1580, the variation was found to be 11° 15′, or one point easterly; in 1657, the needle pointed due north, consequently there was no variation; since this period it has been westerly, increasing constantly at the rate of between eight and twelve minutes a year, and is at present 24° 30′.

The second deviation of the needle is called its dip, that is, the needle which under the magnetic equator preserves the horizontal equilibrium given to it on its pivot, loses this equilibrium in approaching the poles, one end inclining or dipping towards the nearest pole. The greatest angle of this deviation has been observed in the northern frozen ocean, in latitude 79¾, where it was found to be 82°.

Diurnal and other oscillations of the needle are also observed,(A a) and the intensity of the magnetic powers, particularly the dip, augments in going from the equator to the poles.

If the variation of the compass always remained the same, or if the increase and decrease were regular in every part of the globe, it is evident the longitude of a ship at sea might be deduced from the knowledge of the exact variation. On this idea, variation charts have been constructed, but which have been all found so erroneous, that their

then use in correcting the reckoning, which for a time had strenuous advocates, has been entirely laid aside.

AN

HISTORICAL ESSAY

ON THE

RISE AND PROGRESS

OF

MARITIME GEOGRAPHY.

First Period.—From the earliest Ages to the Decline of the Roman Empire.

The different dispositions and capacities of individuals must, soon after the commencement of civil society, have given birth to a commerce of exchange; for he who preferred the chace, the shepherd state, or the cultivation of the ground, would naturally seek to barter the superfluities he acquired for the produce of the industry of him whose genius led him to practice the mechanic arts. These first beginnings of commerce must have been followed by successive improvements in navigation. The trunk of a tree, which served the savage in the state of nature, to cross an arm of the sea, or a river, was hollowed into the canoe; this latter was succeeded by the boat, the bark, and the ship: and the navigator grown bolder, from the feeling of his security, ventured

on

on the ocean, and visited its coasts, either from motives of curiosity, or for the purposes of commerce. At length the application of the polarity of the magnet to navigation gave to this science a new form, and the seaman fearlessly quitting the coasts, steered his vessel across the pathless ocean. And finally, the perfectioning of Geometry and Astronomy teaching how to measure the courses of the heavenly bodies, the route of a ship on the ocean, is now ascertained, by calculation, with a precision nearly equal to actual measurement.

Voyages of the Phenicians, A. M. 2950. B. C. 1054.

The Phenicians are the first people of whose maritime expeditions we have any consistent account; their situation on the shores of the sea familiarized them to that element, and the barrenness of their country led them to seek in others what their own denied them. So early as six hundred years after the deluge, the navigation and commerce of the Sidonians had acquired such a celebrity, that the patriarch Jacob mentions them at the moment of his death*; and Moses speaks of Tarshish(a) as of a foreign country, visited by the Phenicians.† At a later period these merchants founded colonies in Africa, Spain, and other countries of the Mediterranean, and even extended their navigation beyond the pillars of Hercules into the ocean. It also seems certain, that they navigated the Indian seas; for Scripture tells us that

* Genesis, chap. xlix. ver. 13.
† Genesis, chap. x. ver. 4.

that the ships of Hyram, king of Tyre, brought gold to Solomon from Ophir,[84] which is generally thought to have been situated on the west coast of India. But with the narrow spirit of commercial jealousy, the Phenicians carefully concealed their discoveries from the rest of the world, and stopped at nothing to prevent other nations from following their tracks.

Cosmography of the Greeks, in the age of Homer and Hesiod. A.M. 3000, B.C. 1004.

From these precautions the knowledge of the earth, among the neighbouring people, was long confined to the countries bordering on the Mediterranean, and even with most of these they were but imperfectly acquainted. Homer, in the 18th book of the Iliad, describes the shield of Achilles as representing the cosmography of the age, and on it the earth is figured as a disk surrounded by the ocean, as by a large river, the sources of which Hesiod afterwards placed near the pillars of Hercules. The disk included the Mediterranean much contracted on the west, the Ægean and part of the Euxine seas, so that the centre of Greece is the centre of Homer's world. On the west, the certain geography of the poet did not extend beyond the kingdom of Ulysses, comprehending the isles of Sama, Zacynthos, and some others, with a part of the neighbouring continent; beyond this his knowledge was vague and confined, and the Strait which separates Sicily from Italy may be considered as the vestibule of his fabulous world; the floating rocks, the howling of the monster Scylla, and the terrific Charybdis,

all

all prove that we should now shut our ears to the syren song of the poet.

Sicily itself, though known to Homer, by its appropriate name of Thinacia, (afterwards Thrinacra) is peopled with wonders. Here he places the flocks of the sun guarded by nymphs; here the cyclops, and the Lestrigons Anthropophagi caused the traveller to fly from their country, though abounding in corn and wine. In following the poet west of Sicily, we find ourselves in the region of pure fable, amongst the enchanted isles of Circe and Calypso, and the floating domains of Eolus. It is, indeed, evident that Homer must have been almost totally ignorant of the geography of the Mediterranean west of Sicily; for he makes Ulysses go from the Isle of Circe to the entrance of the ocean in one day, and allows him only the same time to return from the Isle of the Enchantress to the Strait of Sicily.

If we accompany Homer to the north east, we find him in like manner gradually immerging into the region of fable. After passing through the Hellespont, &c. into the Euxine, he mentions the Halizons, a people possibly inhabiting the banks of the Halys, beyond whom are the Amazons, a nation of female warriors, to whose country succeeds the kingdom of Colchis, near the circumference of the disk, on which the poet places the palace of the sun, and the theatre of the amours of Apollo, with a daughter of the ocean.

To the south east the geography of Homer is

more

more extended; for we find him acquainted with the whole west coast of Asia Minor, not entirely ignorant of the country of the Phenicians, whose purple stuffs, gold and silver works, naval science, avidity and cunning, afford him subjects for several moral traits; nor with Egypt, whose river he knew by the name of Egyptos, and of whose inhabitants he praises the medical skill. Between Egypt and the pillars of Hercules the distance is much shortened, and is occupied by a country named Lybia, where, says the poet, "the lambs "are born with horns, and the sheep bring forth "three times a year."

The circumference of the earth was, according to Homer, covered with a solid vault or firmament, under which the sun and moon performed their daily journeys in chariots rolling on the clouds. In the morning the luminary of day arose from the bosom of the eastern ocean, and in the evening sank in the western; a golden vessel, the workmanship of Vulcan, during the night, transported him back by the north to the east. Beneath the earth the poet also placed a vault, named Tartarus, corresponding with the firmament, where in eternal night dwelt the Titans, the enemies of the gods. Hesiod even determines the height of the firmament, and the depth of the gulf of darkness; an anvil, says he, would be nine days falling from the heavens to the earth, and as many descending from the earth to the bottom of Tartarus.

The world of Homer was terminated on the west

west by two fabulous countries; near the sources of the ocean, and not far from the dismal caverns of the dead, were the Cimmerians, an unhappy people, immersed in eternal darkness; beyond them in the ocean, and consequently, according to the poet, beyond the limits of the earth and the empire of the winds and seasons, is Elysium, where neither tempests nor winter are ever felt, where the soft zephyr continually murmurs, and where the elect of Jupiter, snatched from the common lot of mortals, enjoy eternal felicity. Beyond this happy region the earth was enveloped by an indefinite chaos; "a confused mixture of existence and nothing; a gulf, where all the elements of heaven, and Tartarus of the earth and the ocean were confounded; a gulf, dreaded by the Gods themselves."

To the unhappy Cimmerians, and the ever blessed inhabitants of Elysium, Hesiod added the Macrobians, a people of large stature, adorned with all the virtues, and whose lives were prolonged to a thousand years at least; "the nectar of flowers was their food, and the dew of heaven their beverage." Near them the same poet places the Arimaspes, a very clear sighted people though with but one eye; and the Griphons or guardians of the precious metals in the Riphean mountains. As the geography of the west was extended, all these marvellous people were transferred onwards; the Cimmerians to Asia Minor and Germany, where two people were found with names somewhat similar, inhabiting the shores of the Cimmerian

dan Bosphorus, and the Cimbrick Chersonesus. The Hyperboreans, another fabulous people of the Greeks, were successively transferred to an island which corresponds with Great Britain, and to the northern extremities of the earth, where they were made to inhabit a very agreeable country, which is explained by the days and nights being each six months long, or by the momentary proximity of the sun, when, according to the ideas of Homer, he passes during the night by the northern ocean to return to his palace in the east.

The Greeks, in the age of Homer, were indeed so little skilled in navigation, that the most trifling voyage was considered an heroic enterprise; during the day, they never lost sight of the shore, and on beholding the setting sun, they immediately sought for a place of shelter, and either hauled their barks on shore, or came to an anchor for the night. Thus Menelaus employed eight years in visiting the Isle of Cyprus, Phœnicia, Egypt, and Lybia; and Homer tells us, that none but *pirates* ventured, at the risk of their lives, to steer direct from Crete to Lybia.

Voyage of the Argonauts, A. M. 2720. B. C. 1304.

The most ancient relation of the famous voyage of the Argonauts is founded on the Homeric cosmography. Jason and his companions, according to Hesiod, passed from the Mediterranean by the Euxine and Phasis into the Eastern Ocean; but, being prevented from returning by the same route, in consequence of the fleet of Colchis blockading the Bosphorus, they were obliged to make

make the circuit of the coast of the Ethiopians and to cross Lybia by land, drawing their vessels with them; and after a journey of four days in this manner, they arrived at the gulf of Syrtis in the Mediterranean. Other ancient writers conducted the Argonauts back by the Nile, which they supposed to communicate with the Eastern Ocean, while later ones endeavouring to reconcile the ancient tradition with the discoveries of their own times, made them take a route by the Palus Mæotis and Tanais into the northern ocean, and round the supposed northern limits of the earth, by the west to the Strait of Hercules, by which they again entered the Mediterranean. Finally, when the non-existence of the communication between the Palus Mæotis and the northern ocean was proved, the Argonauts were supposed to have ascended the Danube; a branch of which was thought to empty itself into the Adriatic.(C a)

The poetic fables and vague traditions of the Greek primitive geography were gradually exploded by the foreign and intestine wars, and by the growing spirit of ambition, which obliged or induced a portion of the inhabitants of Greece either to seek a new country or sources of riches and power in distant regions. The Milesians and Megarians formed commercial establishments in the coasts of the Euxine. The Corinthians colonized Sicily, while the Phoceans, flying from oppression, settled in Sardinia, in Corsica, and in Gaul, where they founded Marseilles. Coleus, a Samian, driven out of his course by a tempest, passed the

Strait

of Hercules, and navigated the real ocean. After visiting Tartessus, the Peru of these days, and probably a country of the South of Spain, he returned to Greece with such riches as increased the avidity of other adventurers. In vain the Phenicians attempted to check the navigation of the Greeks; the latter appear even to have procured some of the charts that guided the Phenician vessels, and Anaximander, a Milesian, first published a map of the World. Still, however, the various cosmographies were equally far from the truth, thus Anaximander compared the earth to a cylinder, Leucippus to a drum, Heraclitus to a boat, while others gave it a cubic form, and Xenophon and Anixamenes conceived it to be a vast mountain whose base extended to infinity, and of which the heavenly bodies illuminated all the different parts by revolving round it.

Geography of Herodotus. A. M. 3550. B. C. 474.

Herodotus was the first who, rejecting the geographical fables of his time, put faith only in what he saw himself or learned from ocular witnesses. In his long voyages and journeys, he visited the Greek colonies of the Euxine from the Bosphorus to the Phasis. Destitute however of astronomical and geometrical bases, while he felt that his own discoveries and knowledge did not at all agree with the generally received ideas, he was unable to combine them into a system, and although he rallies Homer's Ocean River, which he says he could never find, and his Orbis Terrarum of which he could discover no trace, nevertheless when he attempts to give general ideas of the earth, he falls into

the Homeric system in spite of himself. He hesitatingly admits three parts of the world, but Europe separated, according to him, from Asia, by the rivers Phasis and Araxes and by the Caspian Sea, he supposes larger than Asia and Lybia taken together. As to Asia, he believed that a fleet sent by Darius circumnavigated it from the Indus to the confines of Egypt, while with regard to Africa, he was unacquainted with any point between Carthage and the pillars of Hercules. On the East coast, he was well acquainted with the shores of the Arabian gulf, but makes this continent terminate considerably North of the Equator. He has also preserved to us the traditionary relation of an apocryphal voyage of the Phenicians round Africa, which still divides the opinion of geographers[D n]. With respect to the North of Europe, Herodotus knew that the Phenician colony of Gadez received tin and amber from these regions, but could not fix the position of the isles Cassiterides, from whence came the first of these objects, and was still more ignorant of the proper country of the second.

Voyages of the Carthaginians, A. M. 3500—3600 B.C. 500—400

From the Greeks we turn to the Carthaginians, the descendants of the Phenicians, and the inheritors of their naval and commercial spirit. The situation of Carthage eminently fitted her for an extensive commerce by sea, and from her navigators, maritime geography received considerable extension.

The voyage of Hanno, supposed to be performed about the time of Herodotus, had for its object the

the foundation of Carthaginian colonies on the coast of Lybia beyond the pillars of Hercules, for which purpose he sailed from Carthage with a fleet of sixty vessels, each rowed by fifty oars, and escorting a convoy with thirty thousand persons of both sexes. Geographers differ with respect to the extent of Hanno's navigation on the coast of Africa, some limiting it to Cape Nun and others extending it to Cape Threepoints on the coast of Guinea.

Of Hamilcar.

In the same century, Hamilcar, after a voyage of four months to the North, arrived at the isles Oistrymnides, probably Scilly, and on the coast of Albion. It also seems probable, that the Carthaginians had, even earlier, discovered the Canaries, for Diodorus mentions a large romantic and distant island to which this people resolved to remove the seat of their government in the event of any irreparable disaster. Aristotle also speaks of an island, the beauty of which had drawn to it such numbers of the Carthaginians, that the Senate forbade any farther emigration on pain of death.

Atlantides of Plato.

These vague ideas of a fertile isle of the ocean, were circulated in Egypt, from whence Plato transported them to Greece, and cloathing them in his own poetic language, out of them created his celebrated Atlantic Island, "the most beautiful and fertile country of the universe, producing abundance of corn and fruits of the most exquisite flavour, containing immense forests, vast pastures, mines of various metals, hot and mineral

springs, in short, every thing necessary to the wants or pleasures of life. Its political government was admirable, being governed by ten sovereigns, all descended from Neptune, and who, though independent of each other, all lived in harmony; its commerce was flourishing, and it contained several large cities with a great number of towns and rich and populous villages. Its ports were crowded with foreign vessels, and its arsenals filled with materials for the construction and equipment of fleets. Neptune, who was the father, legislator, and god of the Atlantides, had here a temple a stade in length, covered with silver and ivory, and which contained a golden statue of the god, the height of the temple. The descendants of Neptune reigned over the island 9000 years, and extended their conquests over all Lybia to Egypt, and over Europe to Tyrrhenia, their incursions even extending to Greece, but here they were repelled by the Athenians. At length this warlike nation after having rendered its name celebrated throughout the world, suddenly disappeared, an inundation, caused by an earthquake, submerging the whole island in a night and a day." Such is the story of the Atlantic island left us by the Athenian philosopher, in which some moderns pretend to see the discovery of America by the Carthaginians, while others believing the tale literally have sought to demonstrate the probability of its sudden disappearance in the manner related.

While

While the Greeks of Athens were transforming into romance the voyages of the Carthaginians, other Greeks were pursuing the steps of these hardy navigators. About the time of the Peloponnesian war, Scylax collected the itineraries of the navigators of his time, and what has been preserved of the collection contains the coasts of the Palus Mæotis, the Euxine, the Archipelago, the Adriatic, and all the Mediterranean with the West coast of Africa as far as the isle of Cerné of Hanno, or Fedalle, according to Gosselin. Beyond this, says the Greek, the sea is not navigable on account of the thick herbs with which it is covered.* Half a century after, Eudoxus of Cnide first applied geographical observations to astronomy; and about the same time Aristotle inferred the sphericity of the earth from the observations of travellers, that the stars seen in Greece were not visible in Cyprus or Egypt. The same philosopher supposed the coasts of Spain not very distant from those of India; and in another work he describes the habitable earth as a great oval island surrounded by the ocean, terminated on the West by the river Tartessus (probably the Guadalquivir), on the East by the Indus, and on the North by Albion and Ierne, of which islands, however, his ideas were very vague and incorrect.

Itinerary of Scylax, A.M. 3560. B.C. 444.

Eudoxus, Aristotle, A.M. 3600. B.C. 404.

The voyage of Pytheas, nearly in the century after Aristotle, has given rise to as great a diversity of opinion amongst geographers as even Tar-

Voyage of Pytheas, A.M. 3600. B.C. 404.

* May not this allude to the fucus natnus or gulf-weed?

shish and Ophir. This navigator departed from Marseilles, coasted Spain, France, and the East side of Britain, to its northern extremity; from whence, still continuing his course to the North, after *six days* navigation he arrived at a land called Thule, the situation of which has been the object of discussion amongst both antient and modern geographers, and which has terminated in the probable conjecture that it is a part of the coast of Jutland on the British sea.(Ba)

As in human affairs there is no evil without its compensation, so the wild ambition of conquerors while it desolates for a moment the countries it visits, procures to them the lasting benefit of social and peaceful intercourse, which invariably succeeds to the devastations of war. Thus the expedition of Alexander added greatly to the knowledge of the earth; in the suite of the conqueror were several geographers charged to make observations both on the coasts and the interior of the countries they passed through, and their journals formed the ground work of a new geography of Asia. Moreover, the books till now buried in the archives of Babylon and Tyre were, by the order of Alexander, transferred to the city to which he gave his name, and thus the astronomical and hydrographical observations of the Phenicians and Chaldeans becoming more accessible to the Greeks, furnished them with a mathematical basis of which their geography was hitherto destitute.

Expedition of Alexander, A. M. 3670. B. C. 334.

In the century after Alexander, the spirit of commercial enterprise became predominant among the

Commercial Voyages of the Greeks, A. M. 3700—3800. B. C. 300—200.

the Greeks, and each determined to brave the perils of the ocean in search of riches. The Marsellais following the route of Pytheas, visited the North, and Euthymenes in a voyage along the West coast of Africa, arrived at a large river similar to the Nile, which was probably the Senegal. The Greek Kings of Egypt, at the same period, caused a direct trade to be opened with India from the ports of Berenice and Myoshormos* on the Red Sea. Ptolemy Philadelphus, the founder of this commerce, also sent geographers into Asia; and in the same reign, Timosthenes published a description of the known sea ports, and a work on the measure of the earth. The nature of the monsoons, being, however, still unknown to the Greeks, the navigation of the Indian sea remained imperfect and their fleets on their voyages to India continued to creep along the shores as far as the Indus; but their principal commerce was on the coasts of Ethiopia and Arabia Felix.

Hipparchus, A. M. 3819. B. C. 184.

1. Hipparchus, the astronomer, seems to have first conceived the idea of a southern continent uniting Africa and India. On the East coast of the former, however, Cape Guardafui was the limit of the discovery of his time, but it appears that he had some notions of India beyond the Ganges. He also attempted to reduce geography to astronomical bases, but having few celestial observations,

* Berenice, supposed to be on the Sinus Immundus, but there is no vestige of the ancient city. Myoshormos (the port of the Mouse) is thought to be Old Cosseir.

and rejecting every other data, his map of the world is filled with hypotheses as erroneous as those of his predecessors.

Though the Romans had rapidly increased their naval power between the first and second punic wars, their fleets were little occupied in the peaceful navigation of commerce or discovery, and hence the additions they made to maritime geography were of little consequence. From their voyages, however, Polybius collected more correct information respecting the western coasts of Europe, and the same writer himself visited the coast of Africa to Mount Atlas, and was the first who ventured to think the torrid zone might probably be habitable. About the same time Eudoxus of Cyzicus was led to conceive the possibility of navigating round Africa, as is related by Strabo from Possidonius.

Polybius, A. M. 3850. B. C. 154.

"In returning towards the Arabian gulf from India, Eudoxus was forced by contrary winds on the coast of Ethiopia, where he landed and was well treated by the natives, and where he saw a piece of wood on which was sculptured the figure of a horse, and which he knew to be a part of the prow of a ship. As the natives informed him that this fragment had belonged to a vessel that had come from the *west*, he took it with him and returned to Egypt. On his arrival there he caused it to be examined by pilots, who declared it to belong to the prow of a small kind of vessel, used by the inhabitants of Gadez to fish on the coast of Mauritania as far as the river Lixius, and even

some

some of them recognised it as having belonged to a particular vessel of that kind, who with several others had attempted to advance beyond the Straits, but had never been afterwards heard of. Hence Eudoxus conceived it possible to sail round Africa, and determined to make the attempt. He accordingly sailed from Gadez, and arrived at a part of Ethiopia, the natives of which spoke the same language as those amongst whom he had been formerly driven; here he relinquished his intention of prosecuting the voyage at this time and returned to Egypt, the king of which he advised to send a fleet to the country he had visited; but this was at first opposed, and Eudoxus afterwards learning that, under the pretence of sending him to execute this project, his enemies determined to abandon him on some desert isle, he fled into Iberia, from whence he again set sail to attempt the navigation round Africa." Here the adventures of Eudoxus finish, and we have no account of the result of his enterprise.

Voyage of Eudoxus, A. M. 3696. B. C. 114.

Strabo has also left us a complete system of the geography of this age, that is at the commencement of our era. Iberia (Spain) is the first country he describes, and with its coasts he seems to have been tolerably acquainted. Near these coasts he places the isles Cassiterides or of Tin, situated according to one passage north of the port of Artabrus, (Coranna) though in another he describes them as laying parallel with Britain. This apparent difference is, however, reconciled, when we recollect that the geographers of this

Geography of Strabo

period

period made Britain a triangular island, of which the southern point was but little distant from the northern coast of Spain. The Cassiterides were therefore evidently the Scilly islands, which served as an intermediate station or entrepôt to the Carthaginians, who visited the western part of Britain for tin.

With the coast of Gaul, Strabo was not so well acquainted, and his knowledge of Albion and Ierne was still more limited: the latter island he says is reported to be sterile and inhabited by Anthropophagi, strangers to every species of civilization. Ierne is the last country he admits towards the north, and on the continent his knowledge terminated at the Elbe, for he disbelieved the voyage of Pytheas.

Strabo seems to have been also imperfectly acquainted with the north coast of Africa in detail, for he makes the distance between Sicily and the Pillars of Hercules only 13,000 stades. On the west coast his geography is limited to about Cape Roxo, for he seems to have been unacquainted with the voyage of Hanno, and on the east coast his knowledge did not extend beyond a promontory, named Noti Cornu (the southern horn), probably Cape Bandellans. Thus the coasts of Africa were unknown beyond the latitude of 12½° N. At the S.W. extremity, Strabo places the Ethiopes Etherii, and at the S.E. the region of Cinnamon. Between these two extremes he admits but a small space which the great heat had prevented being visited, and this extremity of Africa he supposes

seas to be washed by the Atlantic and Indian Oceans which there mingled their waters.*

Of the coast of India the knowledge in detail of Strabo did not extend beyond the Indus, but he had some vague notions of Taprobane (Ceylon), and of the countries of the Ganges, derived from the relations of the Generals of Alexander.

Discoveries of the Romans, A. D. 80.

The Roman Empire for two centuries after the Christian era remaining the common country of all the nations of the civilized world, we might expect to find its citizens pushing discovery into new regions; but several causes still combined to retard the progress of maritime geography, of which the chief were the imperfection of practical navigation, the want of the compass, and the ignorance of the constant tropical winds. Though, as we have had occasion to observe, it seems probable that the Carthaginians were acquainted with the Canaries, the first positive account of these islands is not more antient than the latter years of the Roman republic. Sertorius and others of his countrymen having fled from Rome, and sought refuge in Spain, there learnt that 10,000 stades to the west of Lybia were two agreeable islands, which offered him and his companions a new country where they would enjoy uninterrupted tranquillity. Twenty years after, Statius Sebosus collected at Gades all the particulars then known of these islands, and from the description of their fertility and

Canary Islands.

* Other writers of this period supposed Africa and India to be united, thus making the Indian sea a vast salt lake; the opinion of Strabo, however, held its ground, and at last produced the discovery of the Cape of Good Hope.

and happy climate they received from the Romans the name of Fortunate.

Periplus of the Erythrean Sea.

The Periplus of the Erythrean Sea, which appears to have been written in the first century, marks the progress of discovery on the east coast of Africa and on the coasts of India. Beyond the Noti Cornu of Strabo, an arid coast without ports or fresh water had long arrested the progress of navigation; but this space was now passed, and commerce extended to the port of Rapta and the isle of Menutias, corresponding with Bandel Velho and the island of Magadoxca. The navigators of this period had also heard of the promontory of Prasum, probably Brava; but their knowledge was so imperfect, that the Periplus tells us "the ocean beyond Rapta is entirely unknown, but is believed to continue its western direction, and after having washed the south coast of Ethiopia to join the western ocean." The Periplus also gives a detailed description of the west coast of India from the Indus to Taprobane; and mentions a part of the coast between Bombay and Goa being infested by pirates as it is at this day. The east coast of the Peninsula is less decisively traced, though the names of Chaberis, Mæsolus, and Calinga, are clearly identified in the Cavery, Masulapatnam, and Calingapatnam, while the Soræ, a people inhabiting the coast, recal the Indian name, Tchoramondalum, or country of the Tchoras, whence Coromandel.

The countries beyond the Ganges, the supposed regions of gold and silver, were known to the

author

author of the Periplus and cotemporary writers by vague hearsay only. Indeed Pliny considers the Ganges as the north-eastern limit of Asia, from which he supposed the coasts to turn to the north and to be washed by the sea of Serica, between which and the pretended strait communicating from the Caspian sea to the Scythian or northern ocean he admits but a very small space: and hence he supposes it very possible, that some Indians might have been driven in a storm from their own coasts to those of Germany; it therefore necessarily follows, that in the system of Pliny the ocean occupies the vast spaces where are Siberia, Mongul Tartary, China, &c. and Pliny

The Periplus is the first work that mentions the monsoons in the Indian seas, the knowledge of which Hippalus procured to the Greeks of Egypt in the reign of Augustus, and hence the S.W. monsoon received his name. The acquaintance with these winds totally changed the manner of navigation in the Arabian Sea, for instead of creeping fearfully along the shores, the seamen, grown more confident, boldly crossed this sea to the coast of India with one monsoon and returned with the next.

In the reign of Vespasian a Roman fleet doubled the northern extremity of Great Britain and ascertained its insularity. Hibernia (Ierne of the Greeks) which had hitherto passed for sterile, and its few inhabitants for anthropophagi, was now better known by the reports of the Britons, from whom the Romans learnt that it enjoyed a climate, Knowledge of the Romans, A. D. 80. 209.

as

as mild as their own, that its fertile soil afforded rich pastures to vast herds of cattle, and that the inhabitants were not more savage than the Britons themselves. In the same century the Roman armies are thought to have penetrated through Germany to the shores of the Baltic, which they supposed to be a branch of the Scythian Ocean, and named it the Sarmatic Sea, from the Sarmates, a people inhabiting the vast country from the foot of the Caucasus to the mouth of the Vistula. The Codanus Sinus of Pliny and Pomponius is evidently the Cattegat; the Cimbrick Chersonenus of Ptolomy, the Danish Peninsula; and the four isles of Scandice, placed by the latter geographer east of the Chersonesus, seem to be the largest of the Danish islands and the coast of Schonen. The isle of Nerigon of Pliny is probably a part of the south coast of Norway.

The promontory of Prasum (Bravz) was the limit of the knowledge of the antients on the east coast of Africa, as the bay of Gonzales de Cintra was on the west; and Ptolemy, not admitting a communication between the Atlantic and the Indian oceans, thought that to the south of this bay the coast of Africa, after first forming a great gulf which he names Hespericus, extended indefinitely between the east and south until it joined India. On the coast of this latter country the knowledge of Ptolemy extended beyond the Ganges to a great gulf, now generally allowed to be the bight of Martaban, which on the east bounded the Golden Chersonesus; consequently

quently this Chersonesus, instead of the Malay Peninsula, according to the opinion of several geographers, will be the elbow of Pegu, of which Cape Negrais is the extremity, and Tanasserim (Thinæ of Ptolemy) will be the limits of the ancient classical geography of Asia on the south east.

Second Period. From the Decline of the Roman Empire to the first Voyages of the Portuguese. A. D. 200—1400.

In the preceding pages we have sketched the progress of maritime geography down to that period when the Roman empire, having passed the zenith of its splendour, began to totter under its own weight. After a rapid decline in the first years of the fifth century it was totally dissolved, and its dismembered fragments became the prey of barbarous hordes, who pouring down like torrents from the extremities of the north, swept all traces of ancient civilization from the faces of the countries they inundated, and immersed the western world in a long night of the darkest ignorance. When at length the ravages of these "Scourges of God" had subsided into regular governments, science still continued to be depressed by religious bigotry, and all thoughts of what the present world contained were absorbed in the most ridiculous efforts to secure a good place in the world to come. But as all partial evil is universal good, so the folly of monkish zeal laid the foundation of a happy revolution

volution in the ideas and manners of the European world. The Crusades, though at the moment only productive of desolation both to Europe and Asia, first gave rise to a spirit of adventure; and the fancied divine call to preach the gospel to the still pagan nations, which towards the end of the middle ages, carried crowds of missionaries to the remotest corners of the globe, added much to general geography; and finally, the use of the mariner's compass gave a new existence to navigation, and a new impulse to maritime enterprise.

Cosmography of Cosmas. 6th Century.

Between the second and sixth centuries the only original work on cosmography that has reached us, is that of Cosmas, an Egyptian monk, who wrote about the latter period: he conceived the earth to be a vast square plain, surrounded by a wall which supported the vault of the firmament; and the succession of day and night as the effect of a great mountain placed to the north of the earth, behind which the sun conceals himself every night. This system, which differs from that of Homer only in the square figure of the earth, was adopted by many Christian writers of the middle ages.

Chart of the 8th century.

In a chart constructed in 787, the earth is presented as a circular planisphere, composed of three unequal portions; and beyond Africa, to the south, are written these words, "Besides these three parts of the world, there is beyond the ocean a fourth, which the extreme heat of the sun prevents us from visiting, and on the confines of which are placed the fabulous antipodes."

But while Christian Europe was thus [illegible]

the public abyss of ignorance, and all science but metaphysical theology seemed extinguished; the followers of Mahomet cultivated astronomy and geography, and pushed their discoveries and their conquests to the eastern limits of Asia. In the middle of the ninth century the Arab navigators had visited China, Sumatra, Java, and other islands of the Malay archipelago, while on the eastern coast of Africa their sovereignty and religion were established from the Red Sea to Cape Corrientes, where terminated the Ethiopia of the Arabs, who seem to have been ignorant of the width of the Atlantic and Indian Oceans; for Edrisi, who composed a treatise on geography in 1153, delineates a large country extending from the coast of Africa to that of India beyond the Ganges.

Voyages of the Arabs, A. D. 861—1050.

On the west coast of Africa the navigation of the Arabs does not appear to have extended beyond Cape Blanco, in the Bay of Arguin; but they have also their apocryphal voyage of discovery to the west. According to the tradition, eight Arab inhabitants of Lisbon, to whom was given the name of almagrurum, or the wanderers, undertook a voyage to visit the farthest countries of the west; and after having navigated eleven days in that direction, and twenty-four more to the south, they discovered several islands, one of which abounded in honey, but whose flesh was so bitter that they could not eat it. From the inhabitants of another island they learnt, that the ocean was navigable thirty days' voyage farther west, but that then a

A. D. 1147.

perpetual darkness rendered any farther progress impossible. Allowing the authenticity of this voyage, and reducing it to its real value, it probably extended no farther than the Canary Islands.

Discoveries of the Scandinavians.

While the Musselmans, unknown to the Christian world, were extending their navigations to the extremities of the east, the votaries of Odin, impelled by a fanatical heroism, or by a desire of plunder, traversed the stormy seas of the north, and discovered new regions in the west. About

Ferro Islands A. D. 860.

860 the Ferro Islands were first visited by the Norwegians; and in the same year a pirate of this nation was driven on an island, which from the snow that covered it, he named Snowland, but

Iceland.

which was shortly after called Iceland. In the same century, Other made a voyage from Helgeland, in Norway, to Biarma, (the River Dwina) on

White Sea.

the White Sea, which is the first relation we have of the North Cape of Lapland being doubled. In 986, an Icelandic nobleman, being banished from that island for three years, determined to employ the period of his exile in voyages of discovery: having heard that land had been seen far to the west, he directed his course that way, and arrived at a country, to which, from its verdure, he gave

Greenland, 982.

the name of Green or Greenland, and which was shortly after colonized by the Icelanders and Norwegians. In 1001, Biorn, an Icelander, sailing from Norway to Greenland, was driven upwards of 1000 miles to the S. W., where he discovered a country, to which, on a second visit, he gave the

Winland, 1001.

name of Winland, from the wild grapes it pro-

ancestors. The Norman Greenlanders formed a colony in this country five years after its discovery; and in 1121, Greenland sent a bishop thither to convert the still pagan colonists to Christianity. From this period we lose all sight of Winland, which modern geographers think to be Newfoundland, unless we admit the doubtful Estotiland of Zeno to be the same country. (Pa) Estotiland, 1380.

The additions made to the maritime geography of Asia, between the second and fifteenth centuries, are almost solely due to Marc Paul, a noble Venetian. In about 1270, he penetrated by land to China, which he describes in detail from his own observation; speaks of Japan from the accounts of others; visited the coast of Tsiompa, notices Great and Little Java, which seem to be Borneo and Sumatra, and the isles Necaurau and Angana, in the Bay of Bengal, (Naucauvery, one of the Nicóbars, and Andaman,) the inhabitants of which, according to him, were anthropophagi, and had *the heads of dogs*. His description of India comprehends the east and west coasts of the peninsula, between the Ganges and the Indus. On the east coast of Africa, his knowledge extended no farther than Zanguebar and the opposite part of Madagascar, which island he first made known to Europe. Asia, Marc Paul, 1270.

Third Period. From the first Voyages of the Portuguese to the Accession of George the Third. A. D. 1400—1761.

The idea that the equinoctial regions teemed

with burning vapours, generally received by the ancients, descended beyond the middle ages, and was considered, not only by the vulgar, but even by the learned of these days, as an article of faith; for, at this period, the powers of nature were so little understood, that it was never suspected the heat of the sun might be so tempered by the winds, rains, dews, evaporation, &c. as to render these regions habitable. This idea presented, in the opinion of those who admitted a communication between the Atlantic and Indian Oceans, an insurmountable obstacle to the navigation round Africa; while others put this navigation entirely out of the question by supposing with Ptolemy, that Africa joined Asia to the S. E. of the Golden Chersonesus. A succession of events gradually dissipated these erroneous ideas, and at length produced discoveries which totally changed the face of Europe, and again fixed the seat of civilization in the west.

First Voyages of the Portuguese to the coast of Africa, A. D. 1370—1400.

In the middle of the thirteenth century, the Portuguese having succeeded in driving the Moors from their country, pursued them to the coast of Africa; they not only wished to exterminate their religion, but also to despoil them of their riches, and each victory was succeeded by a fresh expedition. The unquiet spirits of every nation, whether impelled by a taste for enterprise, or by the desire of glory, flocked to Portugal, where even the women concurred in increasing the general enthusiasm, by refusing their favour to any but those who had signalized themselves against the Moors in Africa.

At

At the beginning of the fifteenth century Prince Henry, son of John I., was at the head of the marine of Portugal. To the general knowledge of the age this prince added a considerable proficiency in astronomy, and a decided predilection for navigation; and, under his immediate direction, several voyages were undertaken to the coast of Africa: in one of which the voyagers were driven by a storm out of their usual course along shore, and for the first time, the terrified mariners found themselves in the boundless ocean. When the storm abated, they were in sight of an island, to which, in their thankfulness to heaven for the succour it afforded them, they gave the name of Puerto Sancto, or the Holy Haven—the least of the Madeiras.[G] A. D. 1418. The voyages of the Portuguese now succeeded each other rapidly; and other navigators of this nation, either grown bolder, or again driven off the coast, discovered the Azores,[Ha] which were at first supposed to be the easternmost of Marc Paul's Oriental Islands; and, on this idea, in the charts which followed their discovery, Cathai, or China, is placed at a short distance west of them.

In 1433, the Portuguese passed Cape Nun, hitherto the limit of their courses, and arrived at a cape which presenting a frightful barrier to the still timid seamen in the terrible surf that broke on the shoals near it, they named Bojador, signifying its projection into the sea and the consequent circuit it required to double it. In succeeding expeditions Cape Verd was reached

1440.—1445. and the Senegal arrived at,* and Lisbon saw with astonishment a different race from the Moors; her navigators were in the habit of making prisoners: these were negro slaves whom the Moors gave in exchange for their own countrymen. Cape Mesurado was the limit of the Portuguese discoveries at the death of Prince Henry in 1463, which damping the ardour of discovery, it was 1471. not until 1471 that the Equator was crossed, and the islands in the gulf of Guinea discovered. In 1484. 1484, the River Zaire was arrived at, and here the country was taken formal possession of for the King of Portugal, by virtue of a Papal bull, obtained in 1432, from Alexander IV., which granted to this monarch the full sovereignty and property of the countries of the Infidels discovered by his subjects.

Arrive at the Cape, 1486. The terrors of the burning Zone, and the belief of the union of Africa and Asia being dissipated by these successive voyages, the passage to India round Africa was no longer deemed impossible, and a fleet was fitted out under Bartholemew Diaz for the express purpose of attempting it. This captain coasted Africa to within sight of its southern point, to which he gave the name of Cabo de Todos los Tormientos, from the violent storms he experienced off it, and which, as well as the want of provisions, obliged him to return to Lisbon,

* The French pretend that their countrymen from St. Malo traded to the coast of Senegal and Guinea in the middle of the fourteenth century. See Vol. ii. In a chart of 1346 written in Castilian, Cape Bajador appears as a known point which had already been doubled.

Lisbon, after an absence of sixteen months. The name of the Cape of All Torments was changed by the king to that of Good Hope, from the prospect it afforded of accomplishing the passage to India.

Cape doubled, 1497.

Ten years however elapsed after the discovery of the cape before this passage was again attempted, and Vasco de Gama had the honour of doubling the promontory the 20th of November, 1497. Sailing along the east coast of Africa, to a part of which he gave the name of Tierra de Natal, from discovering it on Christmas day, he passed through the Mosambique Channel to Mombaze and thence to Melinda, where he procured pilots, and crossing the Arabian Sea arrived at Calicut the 22d of May, 1498.*

Discovery of America, 1492.

While the Portuguese were attempting to arrive at India by the east, the Genoese, Christopher Columbus, conceived the idea of reaching it by the west, which produced a discovery that was totally to alter the face of Europe by inundating it with the treasures of a New World. The relation of Marc Paul's travels had now been published two centuries, and not being corroborated by any succeeding traveller its credibility was almost called in question; when falling into the hands of Columbus, he was led to imagine, as Aristotle and other antients had done, that if Asia really extended so far to the east, its eastern coasts could not be far distant from the western

coasts

* It is thought that the ridiculous ceremony of ducking, &c. on crossing the line was first practised in this voyage.

coasts of Europe, and consequently that it was possible to arrive at India by sailing westward. After in vain offering himself to Portugal and England, and after several years unsuccessful solicitation in Spain, Columbus at length succeeded in convincing Isabella of the feasability of his project, and by her assistance fitted out a few small vessels with which he sailed from Palos in 1492, and after overcoming the numerous dangers and difficulties to which navigation was still subject, on the 12th October he discovered the Bahama Islands, and then Hispaniola and Cuba, whence he returned to Spain. It would appear that the variation of the compass was first observed in this voyage.

In a second voyage in 1493, Columbus discovered Jamaica, and in a third in 1494 he visited Trinidad and the Continent near the mouth of the Orenoco. As Portugal had received a papal donation of all the countries her subjects might discover, Spain now solicited a similar grant, and Pope Alexander the Sixth, in the fulness of Apostolic authority, divided all the countries newly discovered or to be discovered between the two crowns, the original line of demarcation being 27½ degrees west of the meridian of the Isle of Ferro, but for their mutual interest the sovereigns altered the line to 370 leagues west of the Cape Verd Islands, Portugal taking all the countries east of this line, and Spain all those to the west.

Discoveries of the Portuguese in the Indian Seas, 1510—1515.

In 1499, Ojeda, one of Columbus's companions, sailed for the New World, and though he made

little discovery, Americus Vespucius who accompanied him, in what station is uncertain, having on his return to Spain published the first sketches of the new continent, had the good fortune of giving it his name, and thus deprived Columbus of part of his just and dearly earned honour. About the same time Vincent Pinzon discovered the coast near the mouth of the Amazon; and Cabral, commanding the second expedition of the Portuguese to India, fell in with the land farther south, and named it Tierra del Espiritu Santo, and Tierra della Santa Cruz, but which were afterwards changed to that of Brasil, from the quantity of red wood of that name found on it. In 1502, the great Columbus made a fourth and last voyage, in which he explored some part of the shores of the Gulf of Mexico.

The countries thus discovered were, on the original idea of Columbus, supposed to be the eastern extremities of Asia, and hence they received the popular name of the West Indies: at length, in 1513, Vasco Nunez, from the summits of the mountains of Darien, first caught a view of the Grand Ocean, to which he gave the name of South Sea, and which it still retains in spite of common sense. In 1515, the coast of South America had been explored as far beyond the southern tropic.

Discoveries of the Portuguese in the Indian Seas, 1510—1518.

While the Spaniards were extending their discoveries in the west, the Portuguese were pushing forward their's on the east, and between 1510 and 1518 they had visited all the islands of the Malay Archipelago to the Moluccas. By the last line of demarcation,

demarcation, supposing the globe to be equally divided between the two powers, it is evident that these islands were really situated within the hemisphere granted to Spain; but this the Portuguese would by no means assent to, asserting that they were entitled to the sovereignty of all the countries they could discover by sailing eastward.

Voyage of Magellan, 1519.

While this point was in dispute, Ferdinand Magellan, a Portuguese, who had visited the Moluccas in the service of his nation, having received some cause of disgust, offered himself to Spain, and proposed to establish her right to these islands, by sailing to them on a western course. This offer being accepted, Magellan departed from Seville in 1519, with five ships, and coasting South America, arrived at the mouth of the Rio de la Plata, which he at first took for the passage he expected to find into the Grand Ocean, and was not undeceived until he had sailed up it several days, and found the depth decrease and the water perfectly fresh.

Continuing his voyage to the south, Magellan arrived at Port St. Julian, where he tells us he saw a native, twice the height of the tallest of his crew, and whose feet were muffled up in a skin so as to resemble the paws of a bear, whence he received the name of Patagon, and the country that of Patagonia. At length Magellan discovered the passage he sought for, on the feast of St. Ursula, whence he named the north point of its entrance Cape Virginia. He entered this channel, which received his name, on the 21st of October, and

Patagonia.

cleared

sioned it on the 28th November 1819; entering the Grand Ocean with three ships only, one having deserted him and another being wrecked. To the land which forms the strait on the south he gave the name of Terra del Fuego, from the number of fires he observed on it, and conjectured it to be a group of islands, an opinion now generally received but still unverified. Straits of Magellan.

From the strait Magellan sailed N. W. across the Grand Ocean for three months and twenty days without seeing land, when he fell in with an island in 15° S., and shortly after with another in 9° to which he gave the name of Desaventurados, or unfortunate, from their affording him neither water nor refreshments, when his crew were perishing with famine and disease. From these islands, the situation of which is not exactly known, he continued to steer to the N. W., and arrived at the group which he named the Ladrones, or islands of thieves, from the dishonest disposition of the natives. From the Ladrones, still directing his course to the west, on the Saturday of Passion Week he discovered a number of islands, which he named from the day of their discovery the Archipelago of St. Lazarus, and which were subsequently called the Philippines. The first of this archipelago that Magellan touched at was Cebu, with whose king he took part in a war against his neighbours, and was killed in an invasion of Mactan. His squadron thence sailed to Borneo and the Moluccas, discovered Timor, and after many disasters, one vessel only, the Victoria, the Admiral's Ladrones. Philippines.

Admiral's own ship, returned to Spain, round the Cape of Good Hope, arriving at Seville the 7th September 1522. As this was the first ship that circumnavigated the globe, she was drawn up into the city of Seville, and long preserved as a monument of this memorable voyage. Sebastian Cano, her commander, was ennobled and received an appropriate coat of arms, a terrestrial globe, with the motto *primus circumdisti me*.

The companions of Magellan were greatly surprised on their return to Spain to find they had gained a day in their reckoning, a circumstance which every school-boy can now account for in sailing round the world westerly. This voyage also affords a striking proof of the bigotry as well as ignorance of the times in a remark made by the writer of the voyage, that when the dead body of a Christian was thrown overboard it sunk with the face towards heaven, while that of an Indian unbaptised sunk with the face downwards.

The voyage of Magellan was succeeded by many others, conducted by navigators of different nations to the Grand Ocean. In 1527, a Portu-
New Guinea, 1527. guese is supposed to have discovered New Guinea, though the Spaniards pretend that Savaaedra their countryman first visited this island in about 1530, and gave it the name of Papua. There are good grounds for supposing that the Portuguese were
New Holland, 1530. also the first discoverers of New Holland, between 1530 and 1540. In all maps of the world of the 16th century, a great austral country is laid down, the northern parts of which present the general

configuration

configuration of the coasts of New Holland, particularly the Gulf of Carpenteria and the large island to the west of it, as well as a strait separating it from New Guinea; but as this land is made to extend to the south, beyond the parallel of America, the whole was considered as imaginary, and was left out of succeeding maps.

Among the Spanish Captains of the sixteenth century, Alvarez Mendana seems to have been the most enterprising. Quitting Peru this navigator directed his course across the Pacific, and discovered an archipelago, to which he gave the name of Solomon's Islands. On a second voyage to these islands he extended his discoveries; and in a third was accompanied by priests and soldiers, the first to convert the natives, and the second to reduce them to slavery, two objects which in the Spanish system of colonisation have always gone hand in hand: but destiny denied success to the sanctified ambition of Mendana, and snatched him from the world in the isle of Santa Cruz, one of his discoveries, supposed to be the Egmont Island in the Queen Charlotte's group of Carteret. With Mendana died all idea of colonization, and the Solomon's Islands not being found in the position assigned thereby him, were successively placed in parts of the Pacific most distant from each other, and were at last entirely omitted in the charts. The unwearied researches and critical sagacity of Dalrymple have, however, left no doubt of their identity with the easternmost of the Papua Archipelago seen by

Solomon's Islands, 1568, 1575, 1595.

Carteret,

Carteret, Bougainville, Surville, and Shortland. In his last voyage Mendana discovered the group, to which he gave the name of Marquesas de Mendoza.

Discoveries of Quiros, 1606.

Quiros, the companion of Mendana in his last voyage, animated by the same spirit of enterprise, sailed from Lima in 1606, with an intention, according to the expression of a Spanish historian, "to gain souls for heaven and kingdoms for Spain," but more particularly to search for a supposed austral continent; his discoveries were, however, confined to some islands in the Pacific, of which that named by him Sagittaria is evidently Otaheite, and his Terra del Espiritu Sancto the principal island of the New Hebrides of Cook.

Of Torres.

Torres, who commanded the consort ship with Quiros, having parted from him passed through the strait that separates New Holland and New Guinea; but the channel being again forgotten was left out of most charts, till Cook passed through it, and thought himself entitled, as its discoverer, to give it the name of his ship, the Endeavour, but which has again been properly superseded by that of Torres.

While the Spanish navigators were thus traversing the Pacific in the peaceful pursuit of discovery, an intrepid Englishman was carrying devastation to the Spanish shores of the Grand Ocean.

Voyage of Drake, 1577.

The famous Drake, irritated by the losses he had sustained from the Spaniards on the eastern coasts of America, determined to remunerate himself

left from their richer and more defenceless possessions on the West. Having obtained a commission from Queen Elizabeth, he equipped a squadron of five vessels, the largest only one hundred tons and the smallest fifteen, with a total complement of one hundred and four persons. With this small force he sailed from Plymouth the 15th November, 1577, entered the Strait of Magellan the 20th of August of the next year, and cleared it the 6th September: a most extraordinary short passage, for no navigator since, though aided by the immense improvements in navigation, has been able to accomplish it in less than thirty-six days. On Drake's arrival on the coast of Chili, he commenced his depredatory operations against the Spaniards, the relation of which does not enter into the nature of this essay. After coasting the whole continent to the North extremity of Mexico, and being laden with the cheaply purchased spoils of the enemy, he determined to seek a northern passage into the Atlantic. In this pursuit he sailed along the coast to which, from its white cliffs, he gave the name of New Albion, and took possession of it in the usual form for England. Arrived at Cape Blanco, he found the cold so great, that he gave up the search of a passage by the North, and crossed the Pacific to the Molucca Islands, in which long route his only discoveries were some islands in 20° North, which have not been identified by modern navigators. After an absence of one thousand five hundred and one days, Drake arrived at Plymouth,

the

the 3d of November, with only his own ship and fifty-seven men; and though the most serious and apparently too well founded complaints were made of his odious tyranny during the voyage, he was received with distinction by the Queen, who conferred on him the honour of knighthood, and deigned to visit his ship, which was long preserved at Deptford, and when nearly destroyed by time, an arm chair was made of the remains, which is still to be seen in the University of Oxford.

Predatory Voyages to the Grand Ocean.

The great riches, more perhaps than the glory acquired by Drake, awakened the avidity or ambition of numerous adventurers in the same track; but as their sole object was to enrich themselves by plundering the Spaniards, their voyages added little to maritime geography. The commanders in these voyages were indeed no better than authorized pirates, who violated every principal of justice and humanity, both towards their own companions and the Spaniards, as well as towards the defenceless Indians they occasionally met with.*

Voyage of Le Maire, 1615.

The voyage of Le Maire and Schouten was, however, undertaken with a different view from those of the freebooters of the age. The States General prohibiting all their subjects, except the East-India Company, from navigating to the Indian Ocean, either round the Cape of Good Hope or through the Strait of Magellan, it became a general object

* Such were the voyages of Cavendish, Van Noort, Dampier, Funnel, Rogers, Clipperton, Shelvock, &c.

object to discover a passage which would enable private adventurers to share in the trade to India without infringing the law. For this purpose, as well as to look for the supposed southern continent, Le Maire and Schouten, conceiving that probably America terminated in a promontory similar to that of Africa, sailed with two ships to the South, and coasting Patagonia, discovered the Strait which bears the name of Le Maire, and the island which forms it on the East, to which they gave the name of Staten Land. Continuing their course to the South, on the 31st of January they doubled the southern point of America, which was named Cape Hoorn or Horn, after one of their ships; from this Cape they steered across the ocean to the N. W. and discovered several islands in the Pacific, to which they gave the name of the Mischievous Islands, from the reefs and dangers that surrounded them. Here they gave up the search of a southern continent, and steering to the North, passed to the East of the Papua Archipelago; then changing their course to the West, discovered the East coast of the island afterwards called New Ireland, and coasting along its North side as well as the North side of New Guinea, (supposing them both to be one land) they arrived at the N. W. extremity of the latter, which appearing to be separated from the great land they named William's Island, after Schou-

Cape Horn, 1616.

ten,

1 King George's, Prince of Wales's, and Palliser's Islands evidently belong to this group.

ten, and its North point, the Cape of Good Hope, from its affording them a prospect of speedily reaching the Molucca islands, where they accordingly arrived in a short time.

This voyage added considerably to maritime geography, though many of the islands in the Pacific, then discovered, have from the errors in their estimated longitudes, been claimed as new discoveries by more recent navigators. The coast of America, from the Strait of Magellan round Cape Horn, was now first visited,* and a new passage discovered from the Atlantic into the Grand Ocean. Between 1616 and 1640, several Dutch navigators visited the North and West coasts of New Holland; and, in 1642, Tasman, quitting Batavia with two ships, visited the southern extremity of this country, and named it Van Diemen's Land; from hence he pursued his course to the East, and discovered New Zealand, in which the favourers of that belief again found their southern continent. Tasman then steered to the North, and discovered several islands, to one group of which he gave the name of Prince William, which are evidently the Fidji islands of the natives.†

Discoveries of the Dutch on the coasts of New Holland, 1616—1640.

La Roche, 1675.

Davis,

* M. de Fleurieu, in a critical examination of the southern lands of Drake or Isle Elizabethides, proves almost to a demonstration, that they are no other than the islands at the southern extremity of America, and consequently that this extremity was discovered (though unknown to himself) by our countrymen, forty years before the voyage of Le Maire.

† In 1675, La Roche, a French captain, carried by the winds and current out of his course to the East of Strait Le Maire, discovered a land which is evidently that afterwards called New Georgia, by Cook.

Davis, in a predatory voyage to the Grand Ocean in 1680, pretended to have discovered land in that ocean, in 26° South, but which has since been sought for in vain. To Dampier, another freebooter, but probably the most enlightened navigator of his time, we owe the knowledge of the Strait that separates New Guinea from New Britain, and which bears his name, together with some information respecting the N.W. coast of New Holland. In the same year (1683), Cowley, in a voyage to the Grand Ocean for the same purpose of plundering the Spaniards, pretended to have discovered a great island in the Southern Ocean, East of Patagonia, in latitude 47°, to which he gave the name of Pepy's land, but as there is now known to be no land in or near this parallel, this supposed discovery is generally thought to be the Maiden-land of Sir Richard Hawkins, discovered and so named in honour of Queen Elizabeth in 1594, and which was subsequently visited in 1689 by Strong, who named the channel that separates the two largest islands, Falkland's Strait, which name was afterwards extended to the whole group by the English.*

Southern Land of Davis, 1680.

Discoveries of Dampier, 1683.

In 1721, the Dutch East-India Company sent three ships commanded by Roggewein, on a voyage of discovery to the Grand Ocean. After doubling Cape Horn, they first sought for the supposed land of Davis, which was believed to belong to the southern continent. This search, however,

Voyage of Roggewein, 1721.

* See Falkland's Islands, vol. iii.

however, produced only the discovery of Easter Island, a solitary rock rising from the abyss of the ocean, at an immense distance from any other land. From this island, Roggewein pursued nearly the track of Le Maire, to the N. W., discovering several islands, of which those named by him the Pernicious are evidently the Palliser's islands of Cook. This is the first voyage in which we find the luminous appearance of the sea noticed.

In 1738, the French East-India Company sent two ships, commanded by Bouvet, to look for the southern continent, and according to their relation, they discovered land in 50° S. to a point of which they gave the name of Cape Circumcision, from seeing it on the first of January. The ice and fogs prevented the ascertaining its extent, and Captain Cook, who afterwards sought for it, passing a few leagues from it, denied its existence. It has, however, been recently refound, and proved to be an island of a few miles in circuit, in 50° 11′, to which is given the name of Bouvet's Island.

Cape Circumcision, 1738.

The voyage of Anson is the last towards the South, in this third period of the progress of discovery which we are called on to notice. The celebrity this voyage has acquired is, however, solely due to the animated stile and exaggerated descriptions of its relation. The terrors of a landsman produced a horrid picture of eternal storms, that long caused the doubling Cape Horn to be considered with a degree of terror it does not deserve,

Voyage of Anson, 1740.

scurvy, while the mortality of the crews is to be attributed to the faulty selection of the men, to the badness of the ships, and their deficient equipment, but above all, to the ignorance of the simple means now so successfully practised to preserve the health of seamen in the longest voyages. The descriptions of Juan Fernandez and Tinian are either the exaggerations of an enthusiast or wilful misrepresentation, from which succeeding visitors to these islands have received much disappointment. To Anson, however, belongs the honour far greater than that of discovery, of being the first commander in the Grand Ocean, who in his warlike operations, did not disgrace the flag of his country by the ill-treatment of his prisoners.

Voyages to the North, chiefly in search of a northern passage, 1495.

The discoveries of the passage to India and of America, awakened the dormant energies of the northern nations, but who deeming themselves precluded by the papal donations from following the tracks of the Portuguese and Spaniards, conceived the idea of penetrating to India by the North, a hope which caused the most distant penetrable recesses of the polar regions to be explored in a great number of voyages, commencing from the close of the sixteenth century. We shall here confine ourselves to the mention of those which produced any material discovery, referring the reader to the note[11a] for the chronological series, which though useful as a historical document, could only be embarrassing and tiresome in the text.

Three or four years after the discovery of

Voyage of Cabot.

America, John Cabot quitted England with five vessels, under the royal flag, to make discoveries in the east, the west, and the north, and to take possession of the countries inhabited by Pagans, and not previously discovered by other Christian powers. In 1497, the same Cabot made a second voyage to the west, and named the first land he arrived at Prima Vista, or first view, which was shortly after changed or rather translated to Newfoundland; from hence he explored the coast to the latitude of the Strait of Gibraltar, which supposes him to have reached the Chesapeak. Five years after, Cortreal, a Portuguese, also visited Newfoundland, and thence steering to the north, discovered the river St. Lawrence, and explored the coast to a strait, to which he gave the name of Anian, and to the country, that of Tierra de Labrador, from its seeming fitness for culture. The Strait of Anian appearing to Cortreal to afford a communication between the two oceans, he returned to Portugal to procure the means of prosecuting his discovery; but perishing in a second voyage, and the situation of the strait being ill defined, it was long sought for in vain on both sides of America, and its name was at last omitted in the maps. A recent geographer has, however, critically identified it with Hudson's Strait, entering Hudson's Bay.

Ponce de Leon, 1512.

In 1512, Juan Ponce de Leon, a Spaniard, sailed to the new world in search of a miraculous spring, which, according to the tradition of the Caribbeans, possessed the virtue of renewing youth,

youth, and his pains were repaid by the discovery of Florida.

The discoveries of John Cabot affording no prospect of gold or silver mines, they were neglected by England for near half a century, two obscure expeditions only during that period having come to our knowledge, and their results were confined to visiting Newfoundland. At length Sebastian Cabot (by some thought to be the son, but more probably the grandson of John,) who held the post of grand pilot of England from Edward VI.* conceiving it possible to reach India by a N. E. passage, was chosen president of a society formed for the prosecution of this object. Three vessels were equipped by this association, and sent under the command of Sir Hugh Willoughby, into the Frozen Ocean. One of the ships returned to England the same year, another the Bonaventura, Captain Chancellor, entered the White Sea, and wintered in the Dwina,† but Willoughby himself, after visiting Nova Zembla, put into the river Petchora to winter, where he and his whole crew were frozen to death.

Voyage of Willoughby, 1553, N.E. passage.

Three years after, the same society, which had taken the name of the Russia Company, sent Burroughs to seek for the N. E. passage; but finding Waygatz Strait impracticable from the ice, after

Of Burroughs 1556, N.E. passage.

* Pension salary of 166. 13. 4. equal to 235 of our money.

† While his ship lay frozen up here, Chancellor proceeded to the Czar's court at Moscow, and laid the foundation of the commerce between England and Russia.

wintering at Colmogory, in the White Sea, he returned to England. In 1576, the idea of a N. W. passage being revived, Frobisher was sent under the patronage of the Queen, with three ships, to search for it; but picking up some gold marcasite on the S. E. coast of Greenland, which he named West Friezeland, he returned to England, when the hopes of gold mines induced the Russia Company to send him out a second time in 1577; but this, as well as a third voyage in 1578, produced only a more certain knowledge of the barren and unhospitable shores of Greenland. In 1584, two vessels sent out by Sir Walter Raleigh, to establish a colony in the Chesapeak, discovered the part of the coast now called Carolina, which they named Virginia, in honour of the Queen; and this name was afterwards extended to all the coast on which the English formed settlements.

Voyage of Barentz, N.E. 1584.

In 1584, the Dutch sent Barentz, the best seaman of the age, to seek for the N. E. passage;

Voyages of Davis, N.W. 1585, 86, 87.

and in 1585, 86, and 87, Davis, in the service of an English association, made three voyages in search of one by the N. W. In the first he visited the S. W. coast of Greenland, and gave his name to the branch of the ocean that separates it from the continent of America: in the second, two of his ships sought the passage between Greenland and Iceland, but were unable to penetrate beyond the 67°. Davis himself kept along the west coast to his, Gilbert's Inlet, or God-haab of the Danes, from whence being unable to get farther to the north, he stretched across to the coast of America, which

which he examined to latitude 54°. In his third voyage, Davis arrived on the west coast of Greenland, to latitude 72°, at Saunderson's Hope, and gave it the name of the Coast of London.

In 1596, the Dutch sent Heemskirk and Barentz to the N.E. who discovered Spitzbergen, though there is reason to suppose these islands were seen by Willoughby, whose unfortunate end prevented their discovery from being made known. Heemskirk's vessel being caught in the ice, was obliged to winter on the north coast of Nova Zembla, in the 76° of latitude, where they suffered all the horrors of a Polar winter, and lost Barentz and others; and from whence, abandoning their ship, they arrived in their boats the following summer, at Kola, in Lapland. Of Heemskirk and Barentz, 1596.

Between 1607 and 1611, Hudson made four voyages in search of the N. W. passage. In the first he saw the east coast of Greenland, in latitude 73°, and penetrated to the latitude of 82°. In the second voyage, he attempted to penetrate between Nova Zembla and Spitzbergen, but being stopped by the ice, sought a passage on the coast of Labrador. In the third voyage for the Dutch, he explored the coast farther south, and discovered Hudson's river; and in his fourth voyage, in the service of the Russia Company, he arrived at the Strait, which bears his name, and where his crew, mutinying set him on shore and returned with the ship to England. Of Hudson, 1607, 8, 9—11.

The Russia Company immediately sent Button with two ships to look for Hudson, and to prosecute Voyage of Button, Hudson's Bay, 1612.

cute the discovery through the Strait. The result of this voyage was the knowledge of Hudson's Bay, named after the unfortunate navigator whom they sought for in vain. Several successive expeditions were sent from England to discover the northern passages; but none produced any discovery until that of Billot and Baffin, in 1616; in which they pretended to have advanced through Davis's Strait into an immense Mediterranean, to which Baffin gave his name, and in which they penetrated to the latitude of 78°. Other voyages succeeded, both to the N. W. and N. E., and were all, more or less, unproductive of any important result. The last of those to the N.W. was in 1691, when Fox and James were sent into Hudson's bay, to the S.W. coast of which they gave the name of New South Wales.

Baffin's Bay, 1616.

Fox and James 1631.

In 1676, Wood and Hawes attempted the passage between Nova Zembla and Spitzbergen, but were stopped by the ice in 76°. Here the depth of only seventy fathoms, and the total absence of current, led them to conjecture, that these two lands were united farther north. After several attempts to find a passage through Hudson's Bay, at the expence of the Hudson's Bay Company, in 1737, the British government occupied itself with this grand object, and his Majesty's ships Furnace and Discovery were sent to explore the various inlets of the Bay, but returned as unsuccessful as the former. Several other expeditions were undertaken for the same purpose, and in 1746, Parliament voted a reward of £20,000 to the

Wood and Hawes, 1676.

Furnace and Discovery, 1746.

the discoverers of a northern passage; nevertheless these various attempts produced no discovery worth recording.

While the English and Dutch navigators were vainly seeking a northern communication between the two great oceans on the east side of America, those of Spain were employed in searching for it on the West. In 1537, Cortez, the blood-stained conqueror of Mexico, discovered the Gulf of California; and in 1542, other Spaniards, in seeking for the Strait of Anian, visited the N.W. coast to the latitude of 44°, and here their researches rested for near half a century. At length the visit of Drake roused them from their lethargy, and in 1596, Viscayno was sent to explore the coast, but his voyage terminated 100 leagues north of St. Sebastian. In 1602, the same navigator was dispatched from Acapulco to seek for a port in the neighbourhood of Cape Mendocino, as a place of refuge for the galleons returning from the Philippines; and the discovery of the port of Monterrey was the result of this voyage. Aguilar, the consort of Viscayno, separated from him and pretended to have discovered a channel near Cape Blanco, leading to a large Indian city. Modern researches have, however, banished this pretended Strait to the region of fable, together with most of the long talked of discoveries of De Fuca and De Fonte, whose voyages, although highly doubtful, we must not pass over in silence. De Fuca, according to the relation of Purchas, sailed from Acapulco

Discoveries of the Spaniards on the N.W. coasts of America.

Of Cortez, 1537.

Of Viscayno, 1596, and 1602.

Doubtful voyages of de Fuca and de Fonte.

Acapulco in 1592, to seek for a communication between the two oceans. Between the 47 and 48 degrees of latitude, he entered a strait 30 to 40 leagues wide, in which he navigated until he reached the Atlantic, and returned back through the same strait to Acapulco. The account of the voyage of Admiral de Fonte or Fuente, is only to be found in a periodical work published in England, in 1708, and entitled *Memoirs of the Curious.* According to the narrative given in a letter supposed to be written by the Admiral, the court of Spain having learned that the New Englanders were attempting the discovery of the N.W. passage, ordered a squadron of four vessels to be sent from Callao to meet them, should they succeed, and to seize their vessels. Among the principal discoveries of this more than doubtful expedition, were two great navigable rivers, in latitude 53°, and a considerable archipelago, named St. Lazarus; extensive lakes, handsome and populous Indian towns were passed; and, at length, a vessel was met with who had come from Boston to trade with the Indians for furs, &c. Admitting the authenticity of these two voyages, we may suppose the Strait of de Fuca to be the Gulf of Georgia of Vancouver, and the chain of islands to the north of this gulf, the archipelago of St. Lazarus of de Fonte.

Fourth

Fourth Period.—From the Accession of George III. A. D. 1761—1814.

1. Voyages to the Grand and Great Southern Ocean.

Soon after the accession of his present Majesty to the throne, having happily closed the destructive operations of war, he turned his thoughts to enterprises more humane, but not less brilliant, adapted to the season of returning peace. His ships, after bringing home victory from every part of the known world, were now to be employed in opening friendly communications with its hitherto unexplored recesses.

In the prosecution of an object so worthy of a great commercial people, one voyage followed another in close succession. No idea of distressing an enemy entered into the motives of these voyages, which had for their sole object the extension of science; and with a liberal spirit, hitherto unknown to the nations of Europe, the world was to be benefited by the discoveries they produced; while England alone employed her subjects and her treasures in the undertaking.*

Byron and Wallis, 1764.

The first of these expeditions sailed from England in 1764, commanded by Commodore Byron, in the Dolphin, of twenty-four guns, and accompanied by the Tamer sloop, Captain Wallis. The first object of this voyage was to seek for the Pepy's Land of Cowley, which still retained its place in the maps; but Byron, after a minute examination, clearly proved that this land is no other than

* Introd. to Cook's third voyage

than Falkland's Islands. From these islands Byron proceeded through the Strait of Magellan, crossed the Pacific, within the southern tropic, in which he discovered several islands, and returned to England, round the Cape of Good Hope, in 1766.

Wallis and Carteret, 1766.

Immediately on the return of Commodore Byron, Captain Wallis, his companion, was appointed to command in a second voyage to the Grand Ocean, in the Dolphin, together with the Swallow sloop, Captain Carteret. In the west entrance of the Strait of Magellan the ships were separated, and did not meet again during the voyage. Captain Wallis, in his course across the South Pacific, discovered several islands, particularly the celebrated Otaheite, to which he gave the name of King George the Third's Island. Captain Carteret, pursuing his voyage alone, also visited several islands in the South Pacific, and gave the name of Queen Charlotte to the group, the largest of which, or Egmont Island, is evidently the Santa Cruz of Mendana. Intending to follow the track of Dampier round New Guinea, Captain Carteret passed to the north of the Solomon's Islands, and arrived on the east coast of the land named New Britain by Dampier, which he discovered to be two islands, separated by a wide channel, to which he gave the name of St. George, and to the northern island, that of New Ireland.

Bougainville, 1766.

While Wallis and Carteret were traversing the Grand Ocean for Great Britain, the French flag was likewise displayed in the southern hemisphere. The

The objects of this expedition, which sailed from France in 1766, commanded by Bougainville, the most expert and enlightened seaman that France has produced, were first to surrender the Falkland Islands to the Spaniards, and then to proceed into the Grand Ocean on discovery. Like his predecessors, he added some new islands to the chart of the Pacific. The group named, by him, Navigator's Islands, appear to be the Bauman's Islands of Roggewein; and his Dangerous Archipelago, a part of the Mischievous Islands of the same navigator. He visited Otaheite a few weeks after Wallis, and appropriately named it, New Cythera; and to the group, of which the Espiritu Sancto of Quiros is the principal, he gave the name of New Cyclades. From hence he made the east coast of New Guinea; and not believing the existence of Torres Strait, which would have afforded him a short passage to the Moluccas, he steered to the north, and discovered the land east of New Guinea, to which he gave the name of Louisiade; and passing through one of the western straits of Solomon's Islands, made the northern circuit of New Guinea.

In 1769, Surville, another Frenchman, made a voyage from the East Indies into the Pacific on some private speculation, and landed on the north coast of a country east of New Guinea, which he named Terre d'Arascides, or Land of Assassins, from being attacked by the natives. Surville, 1769.

Though the five voyages we have noticed added considerably to maritime geography, they were but the feeble dawn of that light that the succeeding

voyages

voyages of the immortal Cook spread over this interesting branch of science. Towards the end of the year 1767, the Royal Society desiring to send astronomers into the Pacific, to observe the transit of Venus over the sun's disk, which it was calculated would take place in 1769, a memorial was presented to his Majesty on the subject, and he directed a vessel to be fitted for the purpose. Otaheite being fixed on for the place of observation, the command of the vessel, named the Endeavour, was given to Lieutenant Cook, and he sailed from England in 1768.

First voyage of Cook, 1768.

After accomplishing the astronomical part of his instructions at Otaheite, Lieutenant Cook traced the eastern coast of New Holland, which he named New South Wales, from the 38° of latitude to its northern extremity; and proved, if he did not first discover it to be separated from New Guinea, by passing through the channel which he named after his ship, Endeavour Strait. In this voyage he also visited New Zealand, which Tasman had but barely discovered; and, by ascertaining its extent, and division by a strait, which bears his name, chased the advocates of the southern continent from one of their strong holds. Cook likewise added several new islands among the group, to which he gave the name of Society Islands.

Voyage of Kerguelen, 1772.

In 1772, the French government sent two ships, commanded by Kerguelen, to the Great Southern Ocean, to look for Cape Circumcision, and for land pretended to have been discovered in the same ocean by another French navigator, named Pauli-

niere

pere de Gourville; who, according to his relation, being driven to the south, off the Cape of Good Hope, fell in with land, and entered a river as large as the Seine, inhabited by friendly Indians, cloathed with mats and feathers, from whom he procured provisions, &c. The French, not willing to admit their countryman guilty of a wilful falsehood, pretend that this island might have been Madagascar. The discoveries of Kerguelen were however confined to the dreary and inhospitable island which bears his name, and which he revisited in a second voyage in the following year, but without ascertaining its extent.

Second voyage of Cook, 1772.

The second voyage of Cook, in 1772, in his Majesty's ship Resolution, accompanied by the Adventure, Captain Furneaux, was framed on the most enlarged plan of discovery ever attempted. He was directed to circumnavigate the globe in the high southern latitudes, and to make such traverses into every corner of the great Southern Ocean, as might finally and effectually resolve the grand question of a southern continent accessible to navigation; and this interesting point his researches decided in the negative, beyond the possibility of doubt. The other fruits of this voyage were the correct knowledge of the land discovered by La Roche, in 1675, to which Cook gave the name of New Georgia; the discovery of the eternally frozen Sandwich Land, the nearest known land to the south pole; the ascertaining the extent of the Archipelago of the New Hebrides, which Quiros discovered, and Bougainville touched at;

the discovery of New Caledonia, and of many islands amongst the division which, in this voyage, he named Friendly Islands.

II. Voyages to the North.

But while the southern hemisphere had been thus repeatedly visited, and its utmost accessible extremities explored, much uncertainty still existed as to the navigable limits of our own, and particularly with respect to the existence, or at least the practicability, of a northern communication between the Atlantic and Great Northern Ocean; for the numerous failures in the attempts to discover this passage, during near two centuries, were all attributed to the error or ignorance of the persons that conducted them; hence, in 1773, while Cook was navigating among the southern polar ices, Commodore Phipps was sent with his Majesty's ships, Seahorse and Carcase, to try how far navigation was practicable to the north. This navigator, however, was arrested by the same invincible obstacle, from a solid sea of ice, in latitude 80½°, near the N. E. extremity of Spitzbergen, which had arrested all former attempts to approach the pole.

Of Phipps, 1773.

Third voyage of Cook, 1776.

So firmly was the idea of a northern passage rooted in the mind of the people of England, that government determined to make another grand endeavour to finally decide the question; but, as all attempts had failed between Europe and America, it was now determined to try between America and Asia; and for this purpose Captain Cook sailed

sailed, in 1776, on his third voyage, in the Resolution, accompanied by the Discovery, Captain Clerk.

In this voyage Captain Cook was directed first to examine the land in the southern ocean recently discovered by Kerguelen, and then to proceed through the Pacific to the coast of New Albion, from whence he was to proceed to the north along the coast of America to the latitude 65°, where he was to commence his search for a passage into the Atlantic, and particularly to examine all rivers or inlets pointing towards Hudson's or Baffin's Bays. In the event of not finding such passage, he was directed to seek one through the Frozen Ocean, either round Asia or America. As an encouragement to Captain Cook's crews, the reward of £20,000 for the discovery of a northern passage, which by the letter of the Act of Parliament was confined to the ships of his Majesty's subjects, was now extended to those of his Majesty, and £5,000 were at the same time voted to any vessel that should first approach the pole within one degree.

Though the main object of this voyage was unsuccessful, that is the discovery of a northern passage, it produced a vast addition to maritime geography. Kerguelen's land was examined and its extent determined, several new islands discovered in the South Pacific, former discoveries re-visited, and many new lights thrown on the manners of the natives. The group of the Sandwich Islands in the North Pacific were like-

wise discovered, and here Cook, in losing his life, quitted mortality for immortal fame. The N. W. coast of America, some inconsiderable points excepted, was traced with indefatigable perseverance, amidst storms and fogs, to its apparent extremity at Icy Cape;* considerable additions made to our knowledge of the N. E. coast of Asia from Kamtschatka to the North Cape, the separation of the two continents finally ascertained, and the impracticability of any passage from the Grand Ocean into the Atlantic through the Frozen Ocean, proved to a demonstration.

Trading voyages to the N. W. coast of America.

The great profits which a fur trade to the N. W. coast of America seemed to offer, induced several commmercial speculators to visit this coast, both from the East Indies, the United States of America, and from England, and in the pursuit of their trade, almost all the spaces left unvisited by Captain Cook, as far as the inlet which received his name, were examined, and found to consist of a vast chain of islands, while the continent within them was ascertained to be broken by numerous openings. These discoveries revived the exploded beliefof the Archipelago of St. Lazarus,

* From the voyage of Viscayno in 1602 until 1769, we know of no attempt of the Spaniards to explore the N. W. Coast of America. Roused at length from their lethargy by the visits and establishments of the Russians on these coasts, they determined to prevent their approaching their Mexico, by taking a *bona fidé* possession of the coasts to the north, and for this purpose in 1769 they formed establishments at St. Diego and Monterrey, and in 1775 an expedition was sent from St. Blas to explore and take a formal though a nominal possession of the coasts still farther north; their researches, however, terminated at the latitude 57° 18′

Lazarus, the Strait of de Fuca, and the inlet of Martin d'Aguilar, and in short of the existence of a communication between the two oceans, which Captain Cook was even accused of having denied without sufficient examination.

A favourable opportunity offering in 1790, of clearing up this still doubtful point, it was taken advantage of by government. On the accommodation of the difference between England and Spain, respecting the right of British subjects to trade to and form establishments on the N. W. Coast of America, the Spanish court consented to restore Nootka Sound, and it was thought proper to send out an officer of rank to receive the restitution.

Captain George Vancouver was appointed for this purpose, and his instructions directed him, after accomplishing his mission at Nootka Sound, to examine that part of the coast occupied by the chain of islands abovementioned, "and to ascertain with the greatest exactitude the nature and extent of every communication by water which might seem to tend to facilitate commercial relations between the N. W. coast and the countries on the east of the Continent inhabited by British subjects or claimed by Great Britain," and in particular to search for the strait of John de Fuca, to examine if Cook's river had not its source in some of the lakes frequented by the Canadian traders, or by the servants of the Hudson's Bay Company." Voyage of Vancouver, 1791.

Captain Vancouver sailed from England in the

Discovery sloop, with the Chatham brig, the 1st of April 1791. He first visited the S. W. part of New Holland, named in the charts Lion's Land, and examined the space between Cape Chatham and Termination Island, a distance of one hundred and ten leagues, of which he took possession. From hence he pursued his route to the coast of America, which from the latitude of 30° to Cook's inlet, he minutely examined during three successive summers, tracing every inlet of the Continent to its head, so as satisfactorily to prove the non-existence of any communication by water between the two oceans.

III. Voyages and discoveries in the Frozen Ocean and between the northern extremities of Asia and America.

It was not until the middle of the seventeenth century that the N. and N. E. extremities of Asia were known to be washed by the ocean. In the year 1636 the first Russian vessel descended the Lena to the Frozen Ocean; and three years after the Great Northern Ocean was visited in the vicinity of Okotsk. The further progress of the exploration of these coasts was extremely slow, for it was only in 1690, that the existence of

Kamtschatka

Kamtschatka was learned by the Russians, and five years after they visited it by sea from Okotsk, but did not ascertain its peninsularity, and hence it was long thought to be an island. In 1711 and 1720, the Kurile islands were discovered.

First voyage of Behring, 1728.

Peter the Great, determined to define the l[illegible] of his vast empire, ordered an expedition for [illegible]covery to be prepared and drew up the pla[illegible] himself

himself; but not living to see it executed, his widow, Catherine, caused it to be followed up, and in 1728, Behring, or Beering, a Dane, to whom the command was given, sailed from Okotsk to Kamtschatka, which he ascertained to be a peninsula, and thence explored the coast to the Gulf of Anadyr. In this expedition indices of land east of Kamtschatka were observed, such as floating pine branches and other species of plants, not known on the Asiatic shores, and which always arrived with easterly winds. The Kamtschadales also affirmed, that in clear weather they could see land to the east from the summits of their mountains.

Second voyage Behring 1741.

In consequence of these indices, Behring and Tchirikoff, in 1741, sailed from Okotsk, and first sought for a land said to have been seen by a certain John de Gama, between the latitudes of 40 and 50; but finding none within these parallels they proceeded to the east, and separating, Tchirikoff discovered the continent of America in about 56½, and Behring 2 degrees farther north. Behring on his return was wrecked on the island which bears his name, and where he died.

Though the knowledge of the valuable furs to be procured on the coast of America induced the Russians to visit this coast after the voyage of Behring, and produced the discovery of the Aleutian islands, it was not until 1760, that the Russians of Okotsk learnt from the Tchouktches that their country was only separated from America by a narrow strait; the truth of which

was, however, left to be ascertained by Captain Cook.

Voyage of Billings, 1781.

The visit of this navigator to the north roused the attention of the Russian Government to the countries discovered by its subjects, and which their sterility had hitherto caused to be despised. An expedition was therefore prepared at Okotsk to explore the sea between Asia and America, the command of which was given to Captain Billings, an Englishman, who had served with Captain Cook in his last voyage as a petty officer. While the two vessels intended for this service were building at Okotsk, Billings was directed to endeavour to navigate in smaller ones, from the mouth of the Kovyma round the country of the Tchouktches, into the Great Northern Ocean. This part of his instructions, however, entirely failed, never proceeding more than a few leagues beyond Cape Barrenoi, although his companions were of opinion that a longer perseverance might have succeeded, the attempt being abandoned so early as the latter end of July. The second part of his instructions were not much better executed, the whole amount of new information procured being confined to a few of the Aleutian islands, and some points on the coasts of America and Asia. In 1644, the Dutch had sent two vessels, commanded by De Vries, from the Moluccas, to explore the sea north of Japan; but the constant fogs prevented this navigator from ascertain the correct situation or extent of the lands sailed amongst, and hence, in the charts after

Of De Vries, 1644.

voy-

voyage, an undefined country, called the land of Jesso, is placed between Japan and the Kurile islands. In 1738 and 1739, Spanbergen was sent from Okotsk to examine these lands, but though he threw some new light upon them, it was left for the unfortunate La Perouse and for Broughton, in 1787 and 1794, to fix the geography of this famous land of Jesso, by proving it to be a chain of large islands closely connected with Japan on the south, and by the intermediate Kurile islands with the Peninsula of Kamtschatka on the north.

Spanbergen, 1738.

La Perouse, and Broughton, 1787-1794.

The commencement of the nineteenth century is marked by three voyages intended to clear up some remaining doubts in the geography of the eastern hemisphere. In 1801, Baudin was sent by the French Government to explore the coasts of New Holland and New Guinea, and in the same year the British Government sent Captain Flinders in his Majesty's ship Investigator to examine New Holland, and to determine if it was not divided by some great straits, particularly through the Gulf of Carpentaria. Captain Flinders completely executed his instructions by the close circumnavigation of New Holland, which he found to be a single united land, and for which, in the relation of his voyage, he has revived the more appropriate denomination of Terra Australis.

Baudin, Flinders, 1801.

In 1802, the Russian Government deeming it expedient to endeavour to open a correspondence with the jealous Japanese, determined on sending out an embassy for this purpose, and in consequence

Krusenstein, 1803.

quence Captain Kruzenstein was appointed to command the two ships to be thus employed. The principal geographical results of this voyage, which closes the progress of maritime discovery, were a more correct and extended knowledge of the Japanese and Jesso Islands.

In concluding this essay we may observe, that though the grand harvest of maritime discovery has been reaped, there are, nevertheless, sufficient gleanings left to form a respectable sheaf. We are still ignorant of the northern extent of Greenland, and whether it is an island or peninsula of America, and the north extremities of this continent are also unknown to us. Of the west coast of Africa, from Cape Negro to the territory of the Cape of Good Hope, we know little more than the outline, and the same may be observed of the greater portion of the east coast, as well as of the south and east coasts of Arabia. The Papua Archipelago still remains, in a great measure, unexplored, and many spaces of the Grand Ocean are still unfurrowed by the prow of our vessels, in which may exist lands of considerable extent, yet uncursed with the knowledge of European civilization and European vices.

MARITIME GEOGRAPHY.

NORTHERN FROZEN OCEAN.

General Plan.—Geographical position.

The Frozen Ocean is encompassed by the northern extremities of Europe, Asia, and America, having two *known* entrances. 1st. From the Atlantic, between Lapland and Greenland; and, 2d, from the Grand Ocean, through Behring's Strait. The coasts of Europe and Asia have been explored with a sufficient degree of exactness, but those of America are almost entirely unknown to us; the journeys of Hearn and M'Kenzie only making it probable that in some points they do not extend beyond the 72° degree of latitude.(Ka) There are also grounds for believing the existence of still undiscovered lands north of the peninsula of Tchouktches, both from the information of these people, who affirm that there is an inhabited country which may be reached from the continent in one day on the ice; and from the observations made in Billings' voyage, that if there was not land to the north, the ices would be driven from the coast of the continent in that direction in strong southerly

General View. Geographical position.

southerly winds; but, on the contrary, after forty-eight hours of these winds, the floating ices were still met with in as great abundance near this coast.

Ices.

The first phenomenon that calls our attention in this region are those eternal ices, which have presented an insurmountable barrier to the progress of the most persevering navigators towards the north pole. In sailing from the Atlantic, the whalers first fall in with ice in 76° in small round pieces resembling pancakes; in 77° or 78° they get among ice islands of 200 to 1500 fathoms in length; and in 81° and 82° their progress is usually arrested by connected field ice. In Behring's Strait Cook found the continents joined by solid ice in 70½°.

While our planet maintains its present position relative to its poles, these ices must preclude the possibility of a navigable communication between the Atlantic and Grand Oceans, through the Polar Sea; and on this question we shall transcribe the reasoning of Captain King, the companion of Cook, as perfectly conclusive. "As far as our experience went," observes this officer, "it appears that the sea, to the north of Behring's Strait, is clearer of ice in August than in July, and perhaps in a part of September it may be still more free; but, after the equinox, the days shorten so fast that no further thaw can be expected; and we cannot rationally allow so great an effect to the warm weather in the first half of September, as to imagine it capable of dispersing the ice from the most

most northern parts of the American coast. But, admitting this to be possible, it must at least be granted, that it would be madness to attempt to run from the Icy Cape to the known parts of Baffin's Bay, a distance of 420 leagues, in so short a time as the passage can be supposed to continue open. General View. Ices.

"Upon the Asiatic side there appears still less probability of success, both from what came to our own knowledge, with respect to the state of the sea to the south of Cape North, and from what we learn from the Russian navigators; but supposing the truth of Deshneff's narrative,* and that a vessel has, in some singularly favourable season, found a clear passage round the coast of Siberia, and is safely arrived at the mouth of the Lena, still there remains the Cape Taimura (Cevero Vostoschnoi) stretching to the 78°, which the good fortune of no single voyager has hitherto doubled"—(in one season). It is evident that similar obstacles must attend the attempt to navigate from the Atlantic into the Grand Ocean.

From the reasoning of Captain King it results that, how far navigation towards the pole is practicable, is a question more of curiosity than utility. It appears, however, from the observations of voyagers, that there is reason to suppose the sea more free from ice near this extreme point than some degrees from it, and consequently that by choosing the most eligible track, it may be approached considerably nearer than is usual by the whalers, who, however

* Deshneff, a Cossack, in 1648, is supposed to have sailed from the Kovyma round the peninsula of the Tchouktches to the Anadyr.

General View. Ices. however favourable the circumstances may appear, seldom choose to venture beyond the 81°, or at utmost the 82°, for fear of being unable to return. The most probable track seems to be between Nova Zembla and Spitzbergen, where the floating ices having a greater extent to move in, and where the greater strength and variation of the wind keeping them in constant motion, they are not so liable to unite and form field ice, as between Spitzbergen and Greenland. The remark of De Pages, that near Spitzbergen easterly winds brought fogs and rains, corroborates the idea of the sea being more open to the east; as does that of Linneus, that, in the Lapland Alps, mild weather arrives with northerly winds.

Climate. The atmosphere, among the ices of Spitzbergen, is described by De Pages as differing from that over the open sea or the frozen lands. There are no clouds, properly speaking; but, when the sky is obscured, it is equally so in all parts, as if by an elevated fog: while, when the sun is seen, the heavens are perfectly clear in their whole extent. On the coast of Siberia, Billings represents fogs as almost constant during summer, and of great density, resting suspended close to the sea or earth, the constant compression of the atmosphere preventing their elevation.

The winters in these regions are necessarily extremely severe. Towards the mouth of the Kovyma it was observed that, when the thermometer was 37° below freezing point, the axes, in splitting wood, flew like glass; that when the mercury fell to 50°, the wood became as hard as iron and would

would not split; and that at 65°, the maximum of its descent, brandy froze. When the cold was at this last degree, if a person ventured into the open air, his breath formed an icy vapour round his head; and the act of respiration produced a noise like the tearing of brown paper. The Russians who have wintered at Smeeringberg, in Spitzbergen, however assert that the cold is not more severe there than at Petersbourg; and that, if there is neither wind nor snow, a person can walk in the open air. General View. Climate.

Thunder is seldom heard in the Frozen Ocean, but lightning is not uncommon; and the Aurora Borealis, of which it is the proper region, is extremely bright from October to Christmas.* Though the siderial influence must be much weakened by the distance from the equator, nevertheless the perpendicular rise and fall of tide is in some places considerable, but in general does not exceed eighteen inches.† The currents appear to be irregular, and to change with the winds. On the west coast of Spitzbergen De Pages found them setting to the north, and when arrived at the N. W. extremity of this land, that their direction changed to the N. E. and east, which favours the idea of a more open sea in these directions. Meteors. Tides. Currents.

The

* Lunar rainbows and parhelions, or mock suns, are also frequently seen.

† On the N. W. coast of Nova Zembla the greatest rise observed is eight feet; as the point of the coast of America reached by Hearn, he concluded from the marks on the ice attached to the shore, that the rise was twelve to fourteen feet, while M'Kenzie found it to be only sixteen or eighteen inches at the mouth of his river.

General View. Drift wood.

The drift wood found on the coasts of the Frozen Ocean is not easily accounted for. It is in great quantity on the Isles of Liaikoff, and on the shore between Cape Barrenoi and the Kovyma; while it is said that none is met with to the west of that cape; a circumstance worthy of notice, as it corroborates the supposed existence of land north of the peninsula of the Tchouktches. It is also abundant on the east coast of Spitzbergen, and on the north of Iceland. As the far greater proportion consists of various species of pine, it is most natural to conclude that it is conveyed to the Frozen Ocean by the rivers of Siberia and America. It is said that amongst that found on the coasts of Iceland, species have been met with peculiar to the shores of the Gulf of Mexico, whence some have thought it was brought by the gulf stream, an idea totally inadmissable.

Fish.

The Frozen Ocean is the habitual residence of several species of cetaceous and amphibious animals; and even here the eternal ices cannot secure them from the pursuit of all destroying man.[1.a] If this ocean is not the nursery of the vast shoals of herrings that annually visit our shores, these fish, as well as the mackarel, are extremely abundant, as are several species of the gadus. Testaceous mollusca appear to be very scarce, both as to species and individuals, three or four species only were found by Phipps on the shores of Spitzbergen: not a single one was met with in Billings' voyage on the coast of Siberia; and Acerbi mentions but two species seen by him on the coast of Lapland

land, the buccinium glacialis and buccinium undatum. General View.

Amongst the few quadrupeds that constantly resist the severity of the Polar climate, the white bear and rein-deer are most worthy of notice. The former, as remarkable for its great size and hideous form as for its maternal affection, is almost an amphibious animal, living more on the sea ices than on the land, and continually diving and swimming in pursuit of the seals and fish that constitute its food. It arrives at the length of seven to eight feet, and to the weight of four and five hundred pounds. Its flesh, though somewhat fishy, is esteemed a delicacy in comparison with that of the seal, by the navigators of these seas. Quadrupeds.

The rein-deer is of the same utility to the natives of these frozen countries, as the camel is to the wandering Arab.

The Frozen Ocean is the natural region of the eider duck, which builds its nest in the crevices of the most inaccessible rocks of the coasts and islands, and particularly of Nova Zembla and Spitzbergen; each nest contains five or six eggs, carefully covered with a down, which the parent birds pluck from their breasts. When driven from their first nest they build a second; and, if again disturbed, a third, but go no farther. The ice bird is peculiar to this ocean; is the size of a sparrow, and never seen but on the ice. Birds.

Some of the greatest rivers of the world have their sources in the mountains of Siberia, and empty themselves into the Frozen Ocean; but as Rivers.

General View. a recent geographer elegantly observes, they roll through desert plains, from which an eternal winter banishes the arts and social life; their waters reflect not the images of celebrated cities, bend not under the weight of magnificent bridges, receive not vessels laden with the productions of distant countries;—a vast sheet of water, bordered by a gloomy forest, or a dreary morass, some bones of the mammoth brought to view by the crumbling away of the banks, some canoes of the miserable natives, and innumerable flocks of aquatic birds, or the amphibious habitation of the peaceful castor, are all that a river of Siberia has of remarkable to offer." The rivers of Europe, that fall into the Frozen Ocean, are generally of little consequence; and, except those traced by Hearn and M'Kenzie, we are unacquainted with any of America.

SIBERIA.

From the East Cape of Asia to Cape North, the coast is low with projecting rocky points, but no appearance of a harbour. The country is mountainous inland. Between the capes is Burney's Island (Ouzelan of the Russians), three leagues off shore, and four or five miles in circuit. From Cape North to Cape Schelatskoi, the coast is little known, but forms the great bay of Kamin; and west of Cape Schelatskoi is another gulf, called Tchoun. Cape Barrenoi, farther west, is a mass

a mass of rocks projecting into the sea, the summits resembling the towers and columns of ruined edifices. Spiral Bay, so named from the figure of the rocks that surmount the neighbouring hills, and Wolf Bay, are between Cape Barrenoi and the mouth of the Kovyma. In this space the coast is low and lined with shoals; and in summer, the melting of the snows on the mountains inland form rivulets which reach the sea. The hills are of granite, quartz, and a hard black stone; the vegetable reign is confined to a kind of vetch, the root of which is eatable, dwarf willows and birches, mosses, and a few other small plants. The shores are covered with drift wood. Siberia.

The Kovyma has its source in a ridge of mountains near the gulf of Okotsk, and empties itself amongst many banks into a large bay. Towards its mouth it is frozen by the 20th of September: the thaw begins the middle of May, by the end of which the ice is entirely melted, and an inundation takes place, which lasts till the end of June. In the bay of the Kovyma are the four Medvigbi or Bear islands, and between this river and the Indijerka are several others, of which the barbarous names are alone known to us.

The Indijerka falls into a bay east of Cape Svatoi (Holy Cape), north of which latter are some considerable lands, discovered in 1711 and 1724, and more accurately examined by Liaikoff, in 1770 and 1774. The first island is 15 leagues north of Cape Svatoi; it is low, 100 miles long and 50 broad, with a large lake in its centre.

Siberia. The second island is five leagues north of the first, is also low, 30 miles long and 14 broad. These islands are named after Liaikoff. The land latterly named New Siberia, is 22 leagues north of the second island; it extends indefinitely to the east and north in mountainous ridges. The soil near the shore is a barren sand and ice, producing only a thick moss and a few small plants. Great quantities of the bones and tusks of the mammoth are found on all these lands, as well as the skulls, with the horns adhering, of animals supposed to be the buffalo and rhinoceros;(Ma) and also bones of the great cetaceous animals and of gigantic birds. The beaches of the islands are covered with drift wood, and regular strata of petrified wood are found on New Siberia, which latter has also a considerable river, said to possess species of fishes unknown in the rivers of the Continent: traces of man have also been observed on it. It has been conjectured, that this land is joined to America; but it seems more probable, that it is a great island, possibly united to the supposed lands north of the country of the Tchouktches.

West of Cape Svatoi, the Yana empties itself by several mouths into a great gulf, on the east shore of which is the Russian settlement of Maksenoka. To the Yana succeeds the Lena, the greatest river of Siberia; it rises on the west of Lake Baikal, and after a course of between 3 and 4000 miles, and receiving numerous tributary rivers, it empties itself through islands whose soil is a frozen marsh. Its waters flowing over

over a sandy bottom, are pure and pellucid; and it is navigable for large vessels 300 miles from the sea, where it is obstructed by banks. Siberia.

Following the Lena, in succession are the Olonec, the Anibara, and the Katanga, all rivers of magnitude. The great promontory of Cevero Vostoschnoi,* the northern point of Asia, next presents itself, forming, on the west, the gulf of Taimura, beyond which the Piacina issuing from a lake, empties itself among islands. Next succeeds the Jenissei, a river of the first class, which rises in the mountains west of lake Baikal, and after a course of 1500 miles nearly due north, falls into a deep bay. Its bed is rocky, its water clear, and, with the exception of a few falls, it is navigable nearly its whole extent.

The next considerable river is the Oby, one of the largest of the Russian empire; it is formed by the union of two rivers which issue from Lake Altun: its course is 1700 miles, its waters muddy, and so torpid, that they become putrid under the ice in winter. It is, however, navigable almost to Lake Altun. The gulf of Oby is separated from that of Kara by a great peninsula. The river Kara is insignificant, but is considered by geographers of the present day, as the limit of Asia and Europe.

North of the Gulf of Kara are the islands of

* East Cevero; the west point of the gulf of Taimura is named Cevero Zapodnoi or West Cevero.

Nova Zembla. Nova Zembla,* placed by some geographers in Europe, and by others in Asia; they are two large islands, separated by a strait, named Matotchink, eternally frozen. Both islands are traversed from north to south by a chain of mountains, chiefly of slate, but with some fine black marble with white veins. In the vallies the soil is frozen turf. The rein-deer, the isatis, and an animal resembling the rabbit, but only the size of the rat, are its only quadrupeds. The eider duck is here in its proper climate; and the Samoiedes of the continent visit the southern shores of these islands to collect the down of these birds, and to hunt the seal.

Between Nova Zembla and the continent is Waigats island, the channel between which and the main is named Waigats Strait, in which the greatest depth is 80 fathoms.† The two islands, Matvief and Dolgoi, are S.W. of Waigats, and are considered as appendages of Nova Zembla, which was taken possession of by Russia, in 1679.

Russia in Europe. West of Waygats Straits the coast of Europe forms the Suchoe more or dry sea, a deep gulf, which

* *Zemlia*, Russian, land or country, hence the signification is New Land.

† Different etymologies are given of the name of Waigats. According to some it is from the Dutch, *waaieu*, storm, and *gat*, a narrow channel. Others derive it from the Sclavonian *wajat*, to engrave, because there are numerous images engraved on a promontory of Nova Zembla, opposite the island. The Dutch name Waigats Strait, Nassau; the island Dolgoi, is their Mauritius.

which receives the Petchora, by many branches, among islands formed by its alluvion. Next is the gulf of Tcheskaia, separated by the peninsula of Kanin from the entrance of the White Sea.

The White Sea is a great gulf of the Frozen Ocean, entered between the peninsula of Kanin and the coast of Lapland; and on the south extending to latitude 63° 50′. Its name is derived from its being frozen over, and covered with snow for a great part of the year; its navigation being open only from the middle of May to the end of September. Its shores are deeply indented; it has many rocky islands and shoals, and receives thirty rivers, of which the Mezen, the Dwina, and Onega, are the most considerable. The Mezen empties itself into a bay on the east; and on it is the town of the same name of some consideration.

The Dwina empties itself by two channels formed by an island; it is frozen over from the end of October to between the 20th April and the 10th of May. Archangel on this river, or properly St. Michael the Archangel, was founded in 1584. It occupies an extent of four miles in length, and one and a half in breadth, containing 12,000 inhabitants, of whom 2000 are shopkeepers; the buildings, including the citadel and fortifications, are of wood, the exchange alone being built of brick. It is a bishoprick, and besides the Greek churches, has a Lutheran and a Calvinist place of worship. Though the building of Petersburg has considerably diminished

Russia in Europe.

the trade of Archangel; it is still considerable: in 1802, the value of the exports being near five millions of rubles, and of the imports only half a million.

In 1803 the principal exports were,

Tallow,	near	160,000 puds.	Besides cordage, candles, fish oil, hides, feathers, and furs.
Iron,	..	150,000	
Hemp,	..	87,000	
Flax,	..	24,000	
Tar,	..	87,000 bar.	
Mats,	..	1,040,000 pieces	

The number of vessels entered were,

In	1716	..	233
	1780	..	112
	1784	..	129
	1794	..	207
	1800	..	140
	1803	..	232 — 60,000 tons.

In this year the coasting trade employed 170 galliots, and the fisheries 281 boats.

Of the islands in the White Sea, the most worthy of notice are the Soloffki, in the gulf of Onega, on the southernmost of which is a large monastery of Greek Monks. Wolna Ostrovadeer Islands, are at the entrance of the gulf of Kandalaskaia, and Souknoviz or Cross Island, nine leagues S. W. from Ponnoy on the coast of Lapland, the passage within it being safe. The Knock Johnsand extends from abreast of Cape Svatoi (the West point of the entrance of the sea) to near Ponnoy, or about 30 leagues: there are several dry spots on it, but between it and the main is a channel with twenty-

twenty-five fathoms. The White Sea communicates with the Caspian by the canals of Koubensk and the North which unite the Dwina and Wolga, and with the Black Sea by the canal of Lepalisk uniting the Dwina and Neiper. Russia in Europe.

Quitting the White Sea, and prolonging the north coast of Russian Lapland from Cape Svatoi, we meet in succession the river Jockena or Jeganga, near which are the seven islands (Semi Ostrova) before Skipper bay. Kola river, one of the most considerable of Lapland, has on it the town of the same name, the only one of Russian Lapland. Its buildings are of wood; the population 800, of whom 54 are shopkeepers. It is sometimes visited for provisions, particularly salt fish, by vessels bound to the White Sea, and is also the rendezvous of the Russian fishing vessels in the Frozen Ocean. Before the mouth of the river is the high Island Olierrie, and a little south of it Kilduyn Island, close to the main, with a good road at the east end. Laus Kawen's or Fisher's Island is, properly speaking, a peninsula joined to the main by low land, sometimes overflown. On the south it has Kawen's Harbour, and on the north Munkefiord. The river Peise separates Russian from Danish Lapland. Russian Lapland.

There are but few points on the north coast of Danish Lapland of which we have been able to collect any information. Waringer Bay is a deep gulf west of the Peise, and off its north point is Wardoehuus Island, on which the Danes keep a garrison of twenty men and a captain. The river Danish Lapland or Finmark.

Danish Lapland or Finmark.

ver Tana empties itself with rapidity into a gulf, and has a considerable salmon fishery, which commences in spring and ends after midsummer.

Mageroe or Bare Island, on which is the North Cape,* is separated from the main by a sound of the same name. The Cape is an enormous block of granite, projecting far into the sea, and which being exposed to all the fury of the waves, crumbles away continually. "Here," says an intelligent traveller†, "every thing is solitary, every thing is sterile, every thing is sad and despondent; the shadowy forest no longer adorns the brow of the mountain, the singing of the birds, which enlivens even the woods of Lapland, is no longer heard in this scene of desolation; the ruggedness of the dark grey rock is not covered by a single shrub; the only music is the hoarse murmuring of the waves, ever and anon renewing their assaults on the huge masses that oppose them. The northern sun, creeping at midnight at the distance of five diameters along the horizon of the immeasurable ocean, in apparent contact with the skies, form the grand outline of the sublime picture presented to the astonished spectator. The incessant cares and pursuits of anxious mortals are recollected as a dream, the various forms and energies of animated nature are forgotten, the earth is contemplated only in its elements, and as constituting a part of the solar system."

* So named by Burroughs in 1556. † Acerbi.

ICELAND.

Though the north extremity of Iceland extends but a few miles beyond the polar circle, and consequently it is, properly speaking, almost entirely within the limits of the North Atlantic, its climate seems to authorize our including it among the lands of the Frozen Ocean. It extends from latitude 63° 40′ to 66° 44′, and between the longitudes of 12° 00′, and 25° 00′ W. It is of an oval figure, about two hundred and twenty miles long East and West, and contains one thousand four hundred and five square miles.

When this island was first discovered by the Norwegians in 860, it was uninhabited. It was first colonized by the same nation in 878. The whole country is composed of stony and barren mountains, whose summits, though the highest does not reach five thousand feet,* are covered with glaciers. These mountains present two distinct characters; first, those formed by thirty to forty regular horizontal strata of rock; while the second are composed of various substances mingled and confused, such as great masses of rock, agglomerations of pumice stone, &c. cemented by gravel and clay. These are evidently of volcanic origin, and indeed the whole island may be considered as a vast cauldron filled with combustible matters, whose ignition produces frequent and some-

* Snaefell Jokul, the highest point, is 4558 feet. Mount Hecla, 4000 feet.

Iceland. sometimes most dreadful earthquakes and eruptions; amongst which, those of 1783 were the most tremendous of any recorded in history. "In that year," says the Abbé Ordinaire, "it was feared, that this island would fall to pieces, so dreadful and multiplied were the convulsions produced by its volcanoes and internal fires. A thick sulphureous smoke rendered the island absolutely invisible to mariners at sea, while the people on shore were in danger of being suffocated by it. The fog, which about this time spread over all Europe, was considered as an effect of these exhalations. Frightful hollow roarings proceeded from the bottom of the sea. From Mount Shapton-gluber (Skaptaa Jokul) there poured a terrific torrent of liquid fire for six weeks, which ran ninety miles to the sea and was fifty miles in breadth, and the perpendicular height of its sides from eighty to 100 feet; it dried up twelve rivers and filled extensive vallies, so that the whole surface of the country was in a state of igneous fluidity, and resembled an immense lake of melted metal."

These internal fires have produced a great number of yawning fissures and caverns, and give rise to innumerable boiling springs, which the natives use both medicinally and to cook their victuals without fire. The most celebrated is that of Geyser, near Skalholt, the approach to which is announced by a noise resembling the fall of a great cataract. At intervals, several times a day, it throws up a column of boiling water many feet

in

in thickness, to the height of nearly one hundred feet. Mineral springs are also common, and basaltic columns are scattered over the island, sometimes covering spaces of two or three miles in length without interruption: they have generally from three to seven sides, are from five to seven feet in thickness, and from twelve to sixteen yards in length.(Ma) Iceland.

From the specimens of silver, copper, and iron ores found on the surface, it is to be presumed, that Iceland has mines of these metals; and in other mineral substances it is extremely rich, having sulphur, onyx, zeolite, calcedony, porphyry, pumice stone, rock chrisfal, jasper, agate, carneoles, the celebrated calcareous spath or Iceland spar, that gives a double refraction, several varieties of aigillaceous earth, clay for porcelain, limestone, &c.

The coasts are indented by numerous deep gulfs filled with islands, and abounding in fish, amphibious animals of the genus of phoca,* and sea birds. The rivers, or rather torrents, are numerous and, as well as the lakes, some of which are of considerable size, are well stocked with salmon and trout.

The climate of Iceland is not so cold as its name would seem to denote, but the seasons are very variable. The sea, at a small distance from the shores, is seldom frozen, and very little ice is ever seen near the west coast, notwithstading its proximity

* Phoca Vitulina, Leporina, Barbata, Grælandica.

Iceland. mity to Greenland. On the east coast, the floating ices do not drift farther south than Berufiord in 64½°. The prevailing winds are from the north, and the extremes of the temperature are between 35° below the freezing point to 70°. In some years the month of January is accompanied by violent storms from the N.W. that drive vast mountains of ice into the bays of the north coast, which chill the atmosphere and prolong the winter. On these ices arrive herds of white bears, which commit great ravages among the sheep, but are soon destroyed, government paying ten dollars a head for their destruction, besides purchasing the skins. Thunder is very rarely heard, and never but in winter, and in the vicinity of the volcanoes. The aurora borealis is frequent and very bright.

Though the island at present produces only dwarf willows and beeches, there can be no doubt but that it was formerly well wooded, the roots and trunks of large trees (chiefly birch) being found in the morasses; and a species of fossil or imperfectly petrified wood, apparently oak, called surtur brand, is met with in large quantities, principally in the mountains, and partly supplies the inhabitants with fuel, the deficiency of which necessary is made up towards the south by turf and cow-dung. On the north coast drift wood is generally abundant, the most common species being the fir (pinus abies), willow, and linden. According to the Icelandic annals, wheat was formerly sown in the island with success, but this grain

grain will not now come to maturity; and the ripening of rye, oats and barley, is so very precarious, that agriculture is almost entirely confined to the manuring some meadows for pasture and hay. In the island are reckoned three hundred gardens, producing potatoes, cabbages, carrots, and turnips, but no fruit trees of any kind. The most useful indigenous plants are some cochlearia, and the Iceland moss used in dying. It seems probable, that the destruction of the woods and the feebleness of vegetation in general, is owing to the increased severity of the cold, caused by the accumulation of ice between this island and Greenland, which now forms a solid mass precluding all approach to the latter, though according to the annals, the communication was formerly open. Iceland.

The wild animals of Iceland are the arctic or white, and the brown or blue fox, wild cats, rats and mice. The domestic are rein-deer, horses, black cattle, sheep, goats, dogs, and cats. The rein-deer introduced from Norway have rapidly multiplied. The horses are of a small but large boned breed, and capable of great fatigue; they are the only land conveyances, the want of roads precluding the use of wheel carriages. The black cattle are small and without horns, while the sheep are all furnished with them.* Goats are chiefly found in the north, and there are no hogs.

The

* In 1810, the island had, horses, 27,000; black cattle, 20,000; sheep, 225,000.

Iceland. The dogs are of three varieties, the sheep or Icelandic dog of Buffon, and two other varieties of the Danish dog. The only poultry reared, from the dearness of corn, are a few common cocks and hens. The wild birds which the Icelanders take, either for their feathers or as food, are the swan, wild geese, ducks, puffins, and other aquatic birds, the woodcock, heathcock, &c. The eider duck builds its nest in the rocks of the coast, and its down is carefully collected, but there is a heavy fine for killing the bird. It disappears in autumn, but where it retires to is unknown. The Iceland falcons are considered the best of Europe for sport, and considerable numbers were formerly sent to Copenhagen for the royal amusement, but this tribute is no longer demanded.

Besides the destructive effects of earthquakes and volcanos, the Icelanders have to fear almost equally, the disruptions of the secondary or agglomerated mountains, and the avalanches. The former usually happen in summer, after heavy rains, which washing away the clay that supported the masses of rock, they roll into the vallies, and carry destruction with them. The principal diseases to which the Icelanders are subject, are catarrhal fevers, pleurisy, diarrhœa, leprosy, and hippochondria. Their general food consists of dried or fresh fish, milk, cheese, curds, and bread. As luxuries, meat stewed in milk, smoked meat, porridge of wheat or barley flour and milk, sour and salted butter. The Icelanders observe Lent so strictly, that they not only do not touch meat, but

but even abstain from mentioning it during this season. Their chief beverage is tolerable beer, of their own brewing, and a fermented liquor produced from milk. The higher classes have, of late years, become habituated to the use of tea, sugar, and coffee, wines, brandy, &c. Iceland.

The Icelanders fabricate almost all their domestic utensils at home, and manufacture the whole of their wool into a coarse cloth called wadmar, or into stockings, gloves, jackets, carpets, &c. The men as well as women are employed in their domestic manufactures during winter. As soon as the ice is melted the cutting turf begins, and when the thawed waters have run off from the meadows, they are cleared of the straw and other rubbish collected on them during winter, and which, by preventing the sun's rays from penetrating the ground would hinder the grass from shooting. When this operation is completed, a thin layer of manure is spread on them, which finishes the field labour until the time of mowing, which usually commences in the middle of July, and lasts till September.

The fishery principally occupies the inhabitants of the south and west coasts. Its chief objects are cod and herrings*: the former are cured in the same manner as in Norway. The Icelanders also take for their oil the arctic shark, small whales,

* Cod are as abundant as on the banks of Newfoundland. The herrings arrive in shoals in June and July. About 2000 boats are usually employed in the fisheries.

Iceland. and seals, which arrive at the same time as the white bears on the ice. A part of the fish is, after being dried, reduced to powder, and serves to feed the cattle in winter. The extent of the fisheries, considered as a branch of commercial industry, is, however, very confined, both from the imperfection of the boats and nets and from the want of capital.

Iceland is politically divided into four quarters, or amts, named after the cardinal points, which are subdivided into eighteen syssels, or districts, and these again into lesser jurisdictions, called hreppar. The island is governed by a grand bailiff, who is also bailiff of the southern quarter: the other three quarters are under the immediate superintendance of two subordinate bailiffs. The written laws are according to the Norwegian code, and there is an appeal to the supreme tribunal at Copenhagen. The island has no regular troops.

The population of Iceland in former times is said to have exceeded one hundred thousand In 1810 it was estimated at forty-seven thousand, or about thirty-three persons to a square mile for the whole island, or one hundred and two to one hundred and four, considering only the habitable parts. Volcanic convulsions, and other accidents, epidemical diseases, and more particularly the system of commercial monopoly, which by keeping the people poor discourages marriage, are given as the causes of this decreased population.

The revenue raised in the island is about thirty

thirty thousand rixdollars, the whole of which is supposed to be absorbed in the expense of its government and various establishments; so that the nett revenue to the King of Denmark is confined to the produce of the customs, which is reckoned at little more than six thousand rixdollars. The official communication between Denmark and Iceland is by a packet, which sails from Copenhagen in the spring, and from Christiansand in Norway in the autumn. Iceland.

Iceland has no collection of houses that deserves the name of town or scarcely of village. In the ancient system of commercial monopoly twenty-five ports were allowed the privilege of importation, and at each of these the company had an establishment of three or four houses. In 1787, six of these ports were granted considerable privileges, and as they become inhabited are to enjoy the rank of cities; they are Reikiavik, Westmanna, Grennefiord, Isafiord, Eyafiord, and Eskefiord.*

Reikiavik is now considered the capital of the island, containing five hundred inhabitants, whose houses are of wood coated with tar and red clay; the church and prison alone being of stone. The harbour is sheltered by several small islands, which render it safe.

Skalholt, usually called the capital in books of geography, probably because it is the residence of one of the two bishops, consists of only the

* For the commerce of Iceland, see Denmark.

Iceland.

bishop's house, the church, and a few wooden cottages. In all the other parts of the island the habitations, even of the better sort of Icelanders, are miserable hovels of turf, without windows, and the huts of the common class are such wretched dens, that it is wonderful how any thing in the human form can breathe in them.

The Westmanna islands are a group twelve miles from the south coast. Only one (Heimaly) is inhabited; the rest are the resorts of innumerable puffins, which form the chief food of the islanders.

SPITZBERGEN.

The isles of Spitzbergen, claimed by Russia as a part of her European dominions, are situated in the Frozen Ocean, about three hundred miles north of the north cape of Lapland, extending from 76½° to 80° 9′ of latitude, and between the longitudes of 9° 50′ and 31° 50′ E. They consist of three considerable and several lesser islands. The name of Spitzbergen (peaked mountains), given them by the Dutch, who visited them first in 1596, is, in fact, descriptive of their appearance, which is that of naked mountains rising in craggy peaks, the highest of which, named Black Point, has an elevation of 4500 feet. On the least elevated parts, enormous masses of rock are scattered in a confusion that would at first lead to the supposition of their having been ejected by volcanos, but

but on consideration, they seem rather to owe their appearance to the violent torrents produced by the melting of the snows. The mountains and rocks are composed of different substances, but chiefly of a greyish black compact granite, others whitish grey or yellowish, and some veined like marble. The known minerals are iron, coal, and slate. Spitzbergen.

The vegetable productions are confined to mosses, ferns, cochlearia, celery, endive, water-cresses, and some herbaceous plants. The quadrupeds are rein-deer, white bears and foxes, and it is said that they quit this inhospitable country in September, and traverse the ice to Nova Zembla and Siberia. The only land bird is the partridge, which also departs in the autumn.

The summer season lasts about six weeks, that is from the middle of June to the beginning of August, and this short period also includes the spring and autumn; for during it the plants bud, blossom, and bear fruit; the birds lay their eggs and hatch on the rocks exposed to the south; the rein-deer descend into the vallies and plains, and fatten on the ephemeral pasturage; the torrents roll down from the high ground with great rapidity and clear the bays of ice, which then fill with fish. The few weeks of summer over, winter immediately reassumes its cheerless reign, and all nature re-enters into a state of torpidity. With respect to the atmosphere we are told that the summer is usually foggy, with light and variable winds. July finishes with rains and strong

Spitzbergen. easterly winds, which also prevail throughout August; September, October, and November, are snowy with fresh gales. From the end of December to the beginning of February the cold is at its height, the weather dry, with light winds and calms, and the sky without a cloud. February, March, and April, are snowy and foggy, with strong winds from the N. and N.E. Drift wood, chiefly fir, is brought to the shore by easterly currents.

These islands have many bays and good anchorages; but as the minute description of them would be both tiresome and useless to the great majority of our readers, we shall confine ourselves to the points of the coast most usually visited by the whalers and Russian hunters. The Russians have four establishments on the west side of the islands at Cloak Bay, Green Bay, Vorland, and Cruys. These establishments were formed by a company at Archangel, in 1746, for the purpose of collecting the skins of white bears, rein-deer, and foxes, the skins and oil of seals, the tusks of the morse, eider down, and other sea-birds feathers. For several years five or six small vessels were sent annually, or every second year, to relieve the persons who remained on the islands; but in 1780 they changed their small vessels for one of one hundred tons, which arrives at Smeeringberg harbour every year in July or August. Magdalena Bay, in latitude 79°, is a great basin surrounded by mountain shores, and capable of holding the largest fleets.

The

The Seven Sisters are a group of islands laying off the N.E. extremity of Spitzbergen, and are the nearest lands to the pole yet discovered. Spitzbergen.

Bear Island of the Dutch, and Cherry Island of the English, is situated between the north extremity of Lapland and Spitzbergen; it is fifteen miles long, composed of precipitous hills, and the resort of seals and aquatic birds.

GREENLAND.

Greenland is a large country, the southern extremity of which, at Cape Farewell, is seven degrees within the temperate zone. How far it extends to the north or east is still uncertain, or whether it is a great island, separated from the continent of America by a strait, or a peninsula united to it by the lands at the head of Baffin's Bay. It is, however, proper to observe, that the existence of this bay is called in question by modern geographers; and apparently on sufficient grounds, for no navigator, before or since Baffin, has been able to penetrate beyond the 72° in Davis' Strait, while Baffin pretends to have reached the 78°; besides the native Greenlanders, according to the missionaries, have no idea of this bay, but say their country is separated from America by a narrow strait. Of the east coast our knowledge is still more confined; the barrier of ice which lines it, preventing the approach of navigators. In

Greenland. 1788, a Danish ship is said to have seen this coast $2\frac{1}{2}°$ E. of Cape Farewell; and it is also said to be seen in clear weather from the mountains of Iceland in latitude 65°. Hudson saw it in 73°. The Dutch whalers, it appears, used formerly to visit this coast between the latitudes of 70° and 76°, and gave it the name of Galehamsques, or Hamken's Land. In latitude 70° they found a deep indentation twenty-five leagues broad, which they concluded to be a strait, communicating with that of Davis, from meeting the same species of whales, some individuals of which they occasionally took with the harpoons of the western Greenlanders in them. The knowledge of the western coast however proves that no strait exists between Cape Farewell and the 72°. Des Pages, who supposed himself to be within a short distance of the coast of Galehamsques, in latitude 74° 20′, estimates its longitude on that parallel at 15° 10′ west; and says that the Dutch placed it in 18° 14′, on the parallel of 72°. Combining these data with the reports of the missionaries, that the west coast is inhabited to the latitude of 76°, we may rationally conclude that both the east and west coasts extend to this parallel.

Greenland was discovered, according to the greatest number of chronicles, in 982. The favourable account given of it by the first visitors, caused the Icelanders and Norwegians to send a colony hither in 986. In 1000 the colonists were converted to Christianity; and until 1418 they had a regular succession of bishops from Denmark, and paid

paid the pope 2,600 pounds weight of the teeth of the walrus annually as tithe. The colony was divided into two cantons, named East and West; in the former were the two towns of Garda and Hrattalid, twelve churches, and two convents; and in the latter, four churches and one hundred farms in cultivation. The great plague, which at the commencement of the fifteenth century ravaged all Europe, and depopulated the north in particular, carried off the majority of the inhabitants of Greenland; and in 1418 an unknown fleet arrived, and attacking the weakened colonists, destroyed every thing by fire and sword.* The division of the ancient Scandinavian colony in Greenland into East and West, has given rise to a great geographical error. It being conceived that the eastern canton occupied the coast opposite to Iceland, while it is satisfactorily proved by the routes of the voyagers from Norway and Iceland, that this canton occupied the most southerly part of the west coast: and indeed it is here alone that, for a few weeks in summer, a brilliant verdure justifies the name of Greenland given to this country by the Icelanders. The sites of the two ancient colonies have been discovered by the missionaries, who have found the ruins of seven churches on the S.W. coast, and after passing a space without any such vestiges, they are again met with a little to the north of Cape Desolation. Greenland.

From

* It seems probable that this fleet belonged to the Prince of Friezeland, mentioned in the relation of Zeno as having set out on an expedition to Estotiland.—See note (Fa).

Greenland. From the year 1418 to 1576 Greenland seems to have vanished from the eyes of Europe. In the latter year its south extremity was visited by Frobisher, who named it West Friezeland; and, having picked up some black stones, which proved to be the marcassite of gold, Elizabeth gave the country the name of Meta Incognita, (unknown limit,) and determined on forming a colony here, for which purpose Frobisher was sent out on his third voyage, but the loss of the ships with the materials for building frustrated this plan; and Greenland was again neglected until 1720, when Egede, a Dane, inspired by religious zeal, determined to visit it and seek for the remains of the ancient colonies. Being followed by other missionaries with their families, several establishments were formed on the west coast, and many of the Pagan natives converted. In 1765 the Moravian brethren began to form settlements on the same coast.

Greenland presents an assemblage of rocky mountains whose summits are crowned with eternal snow and ice. The most elevated on the west coast rises to three peaks, called Deers' Horns, that are seen forty leagues. The mountains are composed of granite, argillaceous stone, and a coloured stone, of which the natives make their lamps, boilers, and other utensils. The signs of metals have been observed, and asbestos is met with in the mountains. A new mineral named cryolite has also been found here.

The summer towards the south commences at the end of May, and lasts till the beginning of September.

September. This season would be agreeable did not the thick fogs obscure the atmosphere and weaken the power of the sun. At the approach of winter storms are often violent, but during the greatest cold, which is in February and March, it is usually calm. Thunder and rain are uncommon. The Aurora Borealis is frequent and very bright. The tides in the bays are said to rise sometimes eighteen feet. In the Isle of Onastok, in latitude 60°, is a constant boiling spring. Greenland.

The soil is in general clay mixed with sand. To the north the only vegetation is mosses; but to the south are found small juniper, willows, and birches two or three yards high, together with various berry-bearing bushes, wild angelica, sorrel, tansey, rosemary, scurvy-grass, and other antiscorbutic plants, and some grasses. On the south the missionaries have endeavoured to raise wheat, but the plant, after forming a stalk of some height, always dries up and dies; they have however succeeded better with cabbages, turnips, and radishes.

The coasts are indented with numerous gulfs, filled with islands, and well stocked with fish, particularly cod, hallibut, and herrings. The rocks are the resorts of several species of seals, and of innumerable aquatic birds, amongst which is the eider duck. The rivers are in general small, and as well as the springs freeze in winter, and many of them dry up in summer. They afford salmon and cray fish. The principal fuel is the drift wood, brought to the shores by the currents. The sea-water deposited

Greenland. posited in the crevices of the rocks is formed into salt by natural evaporation.

The quadrupeds are white bears, white and grey foxes, white hares, wolves, and dogs, used by the natives to draw their sledges, as well as occasionally for food; rein-deer are also tolerably plentiful, but the Greenlanders do not take the pains to domesticate them.

The native Greenlanders are evidently the same race as the Esquimaux of the neighbouring continent. Their number is very inconsiderable, being greatly reduced by the small-pox introduced from Copenhagen in 1772. The missionaries calculate under 1,000 the fixed Greenlanders in their establishments, and Crantz estimates the wandering tribes at 7,000 souls. In 1805 the Europeans were 6,000.

Greenland is politically divided into two inspectorships, named North and South, separated by the Strait of Romelpoot, in latitude 68°. In the southern inspectorship are seven establishments of the missionaries and three of Moravians, viz. Julian's Harbour, 61°, Frederick's Harbour, 62½°, Fiskenoset, 63½°, Good Haven, 64° 10′, Sukertoppen, 65° 40′, Kigurtursok and Holsteinborg, 67° 10′. The Moravian are New Hernhaut, near Good Haven, Lechtenfels, in 63°, and Lichtenau, five leagues N.E. of Cape Farewell.

In the northern inspectorship the missionaries' establishments are eleven; one on each of the Islands of Prince Royal and Crown Prince, Egedesminde,

desminde, 68° 20′, Jacob's Haven, 68° 40′, Christian's Haven, 68° 50′, Claus Haven, Good Haven, 69° 10′, in the Isle of Disco, Fortune Bay, eight miles farther north, Rutters Bank, 70° 10′, Umanak, 71°, Uppernavik, 72½°.—For the Commerce of Greenland, see Denmark. Greenland.

John Mayen's or Trinity Island is a great volcano; the high mountain which crosses it is named Bear Mountain. It has several good bays, and was formerly frequented by whalers, but the fish having now retired farther north, it is seldom visited. Rein deer are found on it.

LAPLAND AND NORWAY.

General View.

Islands and Mountains.

In sailing along the west coast of Lapland and Norway, the eye rests on a vast chain of mountains, in the variety of whose singular shapes, nature seems to have exhausted all her forms. Many of them are vast insulated masses of rock lining the coast, whose summits may be seen twenty leagues, and serve as landmarks to the seaman. On the dreary coast of Lapland, they are inhabited only by seals and sea birds,* and here and there a wretched Lapland fisherman.

The fundamental formation of all these islands and mountains is gneiss regularly stratified and dipping considerably to the east. This regularity seems to authorize the supposition of their having received their present formation by some grand and sudden perpendicular convulsion, which either projected these vast masses upwards, or sunk the intermediate grounds which occupied the spaces now forming sounds and fiords. In some few spots near the coast are met tracts of morass, under whose peat surface is a stratum of sand, broken sea shells, and marine plants, thirty feet above the

* The Vars or low islands are preferred by the sea mews, (gulls), whose eggs form a valuable part of the provisions of the Norwegians, and hence the possession of an egg var is considered of as much consequence as a field of wheat in more fertile countries. The puffins prefer the elevated and solitary rocky islands.

the present level of the sea, by which it is probable, these lands were covered posterior to the grand formation of the mountains and islands. General Flow. Islands and Mountains.

Some of the mountains have glaciers, from which great masses occasionally break off, and in their descent dislodging vast blocks of rock, carry desolation into the vallies. In 1756, one of these masses precipitated itself into the Langefiord, which is twelve miles long and two broad, and sixty fathoms deep, the effect of which was so great, that the waters of the fiord rose suddenly and swept away houses two hundred paces from the shore.

The islands even towards the south of Norway are entirely bare of trees, from the influence of the sea air. Towards the north on the main land, beyond 65°, fruit trees are no longer found, and berry-bearing bushes are alone met with; and 67° is the limit of the Norwegian spruce fir, beyond which the only trees are the Scotch fir and birch. It is also observed, that the western fiord in 65° is the northern limit of oysters.

Within the islands, the main is deeply penetrated by inlets named fiords, some of which run fifteen to twenty leagues into the land, and have depths of three hundred to four hundred fathoms, ten leagues from their entrance. In these fiords, and within the islands, ships find shelter from all winds; and towards the south, where there is a constant internal navigation to and from Bergen, when the depth in the fiord is too great for anchorage, iron rings are fixed into the rocks two fathoms above Fiords.

General View. above water for the vessels to make fast to. Even at the northern extremity of Finmark these fiords never freeze, which is doubtless owing to the constant motion of the waters by the strong currents.

Fiords.

Currents. The current which sets out of the Baltic uniting with that of the British Sea, strikes against the south coast of Norway, and runs round Cape Lindesnes and along the coast to the north even to the north Cape. Among the islands this current is extremely strong, flowing through the channels with the velocity of the most rapid river, and when it meets the ebb tide in long and narrow inlets, the opposite forces produce a perfect cataract, or whirlpool, of which the maelström, on the coast of Nordland, is the most celebrated, its vortex carrying down and dashing to pieces against the bottom whatever comes within its influence. It is most furious when strong N.W. winds blow during the ebb tide, and then its noise equals that of the greatest cataracts. In summer when these winds are infrequent and moderate, the maelström is little dreaded, and at every turn of the tide it is tranquil for about half an hour, and may be crossed without danger in a boat. The Saltenström at the entrance of Salten fiord, is a similar whirlpool, and is even considered more dangerous then the maelström by the natives.

Whirlpools.

Monstrous sea animals. Not content with the variety and vast abundance of fish with which nature fills all the gulfs of Norway, the Norwegians pretend that their seas

seas are the residence of several monsters of the deep, of the most extraordinary dimensions and figures. Such are the kraken, some miles in circumference, and whose back is usually so covered with great protuberances and marine plants, that a Norwegian bishop mistaking one of these animals for a newly raised island, landed on, and took possession of it, by saying mass. The sea snake is one hundred fathoms long and the circumference of a tun. Mermen and mermaids are also often seen sporting on the surface of the waters. Were we to abstract what there is of exaggeration in the relations of these wonderful animals, we should probably find the kraken reduced to an over-grown whale, the sea snake to an enormous polypus, and the mermen and mermaids to some monstrosities in the seal tribe. General Plan.

The vicinity of the mountains to the sea preventing the rivers from having any length of course, those of Lapland partake of the nature of torrents. The most considerable on the west coast of Norway are the Namsen, which falls into the Namsen fiord in about 64½° and by which quantities of fir timber are brought down for exportation. The Guul and the Orkedal are next in consequence, and both fall into the long fiord of Drontheim. Rivers.

The most remarkable islands and mountains in prolonging the coast from north to south are, the northern Fuglœ or rock Huygens of the English, a solitary rock distant from any other island, and Islands and Mountains.

General View. Islands and Mountains.

rising abruptly to the height of two thousand feet. Arenœ and Vanœ are still more elevated, the two peaks of the latter exceeding three thousand feet. Ringvadsœ is a large and lofty island. The Storhorn, south of Tromsœ, rises frightfully steep and rocky, surpassing in terrible grandeur every thing that surrounds it. Senjen, a large island separated from the main by Grysound, shoots up on its north side to Alpine peaks. Faxefieldt on the main is an enormous isolated mountain, and one of the highest beyond the polar circle, rising almost perpendicular from the base to the summit, which has upwards of four thousand feet elevation.

The Loffodden islands are a long mountainous chain, separated from the main by the great sound named West Fiord, celebrated for its grand cod fishery.(Oa) Hindœ is the largest of this chain, and Vaagœ is the central rendezvous of the fishing-boats. Stegen rises in three enormous peaks, two thousand feet high, and united by a natural wall of rock. The southern Fuglœ and Landegode tower above their neighbours like two gigantic teeth, and down the sides of Fugloe two cataracts are precipitated from a height of one thousand feet. Nearly opposite these, on the main, is the Kunnen, a vast projecting mass of mountain, ascending almost perpendicularly from the sea to the height of one thousand feet, and except in a very few spots, without even a footpath at the base. It increases its elevation as it goes inland, until at the distance of four miles from the

the sea, its greatest height is four thousand feet. From one of its cliffs a glacier descends to an immediate contact with the sea. General View.

Rodoe, a few miles beyond the polar circle, presents its high rocks like a vast gothic ruin rising from a green surface, and is one of the most striking objects of the north. Trance, cut by the polar circle, has four enormous peaks. Lovunnen, one of the outer islands, is a singular solitary rocky cliff, the resort of innumerable puffins, which are taken for their feathers. Dunnoe rises in two naked horns; Vegoe has also two singularly abrupt tops two thousand feet high, and Alsten has seven peaks, called the Seven Sisters, elevated far above the line of perpetual snow, their height being more than four thousand feet. Torgohötten is a vast insular pyramid two thousand feet high, and Oyskavalenfeldt, on the main, rises to three thousand two hundred feet.

The coast of Lapland, or Finmark, extends to the sixty-eighth and a half degree of latitude, where commences the Nordlands of Norway. The first place worthy of mention, after passing the North Cape, is Hammerfest on Qualoe or Hvaloe (whale) Island, one of the three places of the north erected into towns in 1787. So slow, however, has been its progress, that it yet contains only nine houses and forty inhabitants, and though it enjoys the privilege of exporting the produce of the fishery direct to foreign ports, and several immunities, it has not yet taken advantage of this privilege, nor is there any probability of its rising to consideration, its situation being too far Finmark.

Finmark. north for the purposes of trade; and the scarcity of provisions, and particularly of fuel, renders it an ineligible place for passing vessels to stop at.

Alten, at the mouth of the river of the same name, is a neat village of twenty houses, amongst green fields and lofty firs. The river has a good salmon fishery which commences at Midsummer.

Tromsoe, on a small island erected into a town in 1787, is more considerable than Hammerfest, having one hundred and fifty inhabitants, but like it it has not hitherto taken advantage of its privileges. Hundholm, though without these privileges, has the prospect of surpassing it, from its more southerly situation, and the greater facility of its harbour. Narvoen, on a dreary island, has only a few storehouses to receive the merchandize brought to an annual fair in July. Steenkior, at the northern extremity of the great Drontheim fiord, is a small village of low and crowded houses. Vardelsore is celebrated for its gloves. Levanger resembles a small town, fifty families having settled here in consequence of an annual fair in March. Stordalshalsen has a considerable and almost the only manufacture of earthenware in Norway.

Norway, West Coast.

Drontheim, the third city of Norway, is at the mouth of the river Nid,* and contains 9,000 inhabitants. It has a handsome appearance, though the buildings, both public and private, are generally of wood. Its cathedral, founded by St. Oluff, was

* Antiently called Nideroos (mouth of the Nid), whence its name in Latin *Nidrosia*.

was of marble, and exceeded in size, as well as in magnificence, every thing of the kind in the north. It was almost entirely burnt 1530; the choir alone remaining, which now serves as the principal church of the town. Besides fir timber, Drontheim exports the copper of the mines of Roras. Its trade employs about 500 vessels annually; and in 1785, 250 vessels entered the port. Norway, West coast.

Christiansund is a small town in 63° 10′, as is Molde farther south; both export the produce of the fishery.

Bergen, which long was the capital of Norway, and still claims that honour, is situated semicircularly on the shore of a small valley, over-topped towards the land by high mountains, and well fortified towards the sea. It is well built, all the public buildings and many of the dwelling houses being of stone. Its population is 16 to 20,000. Bergen is the grand depot of all the produce of the fisheries of Finmark and of the Nordlands; one hundred and twenty-six Nordland yachts, each manned with ten to twelve men, being seen at one time in its port.

Stavanger is a small town which exports fish and some timber.

The south coast of Norway commences at the Cape, named Lindesnes (Lime Cape), called by English seamen the Naze. It is the extremity of a rocky peninsula, joined to the main by a narrow isthmus. Its projection into the sea exposes it to the continual fury of the waves, which cover it with a salt vapour, Norway, South coast.

Norway. South coast.

that prevents any other vegetation than some creeping plants thinly scattered among the crevices of the rocks. This frightful solitude is, nevertheless, inhabited by fishermen and pilots, who derive from the sea the means of procuring the comforts of life, and are remarkable for their vigour and longevity. On the Cape are two light-houses, which can be no where more necessary, as it is surrounded by rocks, of which those named the Bishop and Clerks, five miles south of the point, are the most to be dreaded.

From the Naze to the east the shore continues to present a rampart of elevated barren and dreary rocks. Its rivers are, in general, impeded by cataracts; the most considerable is the Glommen, which issues from a small lake in the Alpine ridge of Dovrefieldt, and after a course of 100 leagues, falls into the gulf of Swinesund. In many parts, it is from 100 to 500 yards wide; its waters are beautifully clear, and it has several falls, of which that called Sarpen, near its mouth is the most considerable, being sixty feet perpendicular. The Laugen, the Louen, the Drammen, the Mandal, and the Nid, also empty themselves into the Scagerack and Cattegat. None of them are navigable, and they are all subject to inundations, but they turn many mills, and fertilize the country.

Proceeding to the east from the Naze, at the distance of five miles, we meet with Mandal at the mouth of the river, which exports a considerable quantity of salted and smoked salmon, esteemed the best of Norway. Three leagues farther

farther is Christiansand, the fourth town of Norway. It is well built, with 3 to 4000 inhabitants, and has a good road, besides a convenient place for ships to winter in the mouth of the river Torvedal, a little to the east of the town. In 1799, it exported 150 cargoes, or above 7000 lasts of timber, besides salt fish and iron. The receipts of the Sea Custom-house amount to 14,000 rix-dollars per annum. Norway. South coast.

To Christiansand succeed Fleckerœ island, the sound between which and the main forms the most capacious and secure harbour of Norway; Arendal, built in a marshy situation, on piles, and intersected by canals; Risoer, Kragerœ, and Skeen, a small thriving town of 1800 inhabitants.

Staværn or Fredericks-værn is a small town, protected by a fortress on an island; it sport is capable of receiving large ships, and it has a building place for gun-vessels.

Laurwig, containing 3000 inhabitants, is finely situated on the river Louen: it exports a great deal of iron from the founderies in its neighbourhood. Some leagues east of Laurwig is the gulf of Christiania, which penetrates twenty leagues, and has several branches, some spreading into lakes and bays, while others resemble winding rivers, or artificial canals, cut through rocky defiles. The shores present a picturesque variety of rocks, wooded eminences, vallies, meadows, &c. The entrance of the gulf is pointed out by Faerdar Island, on which is a light.

Christiania, at the head of the gulf, twenty leagues

Norway; South Coast.

from the sea, is the capital of Norway, the residence of the viceroy, and the metropolitan see. It is situated on a fine bay, in a fertile and well cultivated country, and is divided into three parts: 1, the city proper, which was founded in 1624, by Christian the Fourth, when Apslœ the ancient capital was consumed by fire, and it has three suburbs; 2, the fortress of Aggershuus; and 3, the ancient city of Apslœ, or Anslœ, in which is the episcopal palace. The city is well built; the streets being at right angles, each forty feet wide. The castle of Aggershuus is built on an eminence to the west of the city: it is an ancient work, having been besieged by the Swedes in 1310; but its fortifications have been successively augmented, and it has accommodation for a garrison of 1000 men. The total population of the three divisions is 10,000.

The port of Christiania is fit for the largest vessels, having thirty to forty feet depth close to the quay. The channels up the gulf, though they require a pilot, are not difficult or dangerous. The exports are very considerable in fir planks and rafters, pitch, tar, soap, iron, copper, and alum. In 1799, it exported 179 cargoes, or 15,396 lasts of timber, valued at £82,500; iron for £12,000; alum for £2,750; and copper for £1000. It has 136 saw-mills, which cut twenty millions of planks annually, each twelve feet long, and two inches and a half thick. Its manufactures are glass and coarse woollens, and linens; and it builds a considerable number of merchant vessels for sale.

On

On the gulf of Christiania are several little towns or villages, where vessels load timber; such are, on the west shore Tœnsberg, Holmstrand, the three towns of Tangen, Stromsœ, and Bregnæs, situated on the river Dram, whence they have received the general name of Drammen. On the east shore of the gulf is Frederickstad, at the mouth of the Glommen, a small, but the most regular fortress of Norway. Its ramparts have a circuit of three quarters of a mile, and it contains 1,500 inhabitants. Near Frederickstad is the fortress of Kongstein, on a very elevated rock, with a garrison of thirty men. Moss, above Frederickstad, is finely situated; it has 1,200 inhabitants, and exports large quantities of iron from its extensive founderies. Above Moss, on the same side of the gulf, is Drobak. Norway. South coast.

East of the gulf of Christiania is a deep inlet, named Swinesund, separating Norway and Sweden. It commences by an outer basin, communicating with an internal one by a strait, in some parts so narrow that ships' yard-arms almost touch the high rocky shores. On this inlet, and at the mouth of the Tistendal, is Frederickshall, a small handsome town of 3 to 4000 inhabitants; the houses are of wood, painted red, and the streets wide. The falls in the river render it unnavigable, but its mouth forms a small port, where gun-vessels are built. The town enjoys the privilege of depot, no duty being paid on transit merchandize. Its proper commerce consists chiefly in the export of planks, which are sawed by thirty-six mills on the river.

Norway, South coast.

river. The town is itself open, but is commanded by the fortress of Frederickstein, and works dependant on it situated amongst a heap of confused rocks, on the opposite side of the river; and before which the mad-brained hero, Charles the XII. finished his career. The spot where he fell is marked by a simple wooden cross, with his name, and the date of the event.

(The fate of Norway being still undecided when this work was sent to the press, we shall here introduce the statement of its commerce and fisheries, which we had included in the general commerce of Denmark.)

Commerce.

The generally rocky and unproductive soil, and the severity of the climate of Norway, allow it but few resources in agriculture or rural economy; but this want is in some measure compensated by its mines of iron and copper, among the richest of Europe, and by its pine forests, which afford timber, masts, pitch, tar, and potash, while a still more inexhaustible source of wealth is found in its fisheries. The exports of these objects, and of some tallow, butter, horses, horned cattle, silver of its mines, Prussian blue, &c. more than compensate the imports, of which corn is the most considerable and most indispensable, and which it receives from Denmark, Prussia, Courland, and Livonia.

The frozen climate of Finmark precluding its inhabitants from regular industry, their commercial riches consist in the produce of the chase and fisheries, with which they pay for the corn, brandy,

brandy, tobacco, and manufactures they receive. Commerce.
Before 1787, the trade to this country was shackled under a monopoly. It was then made free, and the three ports of Wardœ, Hammerfest, and Tromsœ, were granted the privileges of cities. Various causes have, however, concurred to prevent the good effects expected from these measures. The value of the fish, fish-oil, rein-deer and other skins, eider down, and lesser objects exported from Finmark to Copenhagen in 1788 amounted to 42,376 rix-dollars.

The gulfs and fiords of Norway and Finmark swarm with fish, of which the great cod, herring, mackarel, hallibut, and the arctic shark, are those which afford objects of export. The great cod fishery is carried on on all the coast, from Skudenaes to the North Cape, but particularly in the west fiord, within the Loffodden Islands, where it employs between 3 and 4000 boats, besides 800 Norway yachts and large vessels, and 20,000 persons. The grand rendezvous is at Vaagœ, in February; the produce is estimated at sixteen millions of fish, worth 600,000 dollars, though the fishermen are generally peasants, and ignorant of the best manner of fishing, as well as deficient in capital, to elevate this branch of national industry to the height it is susceptible of.

The cod fishery commences in February and ends in April. The fish is prepared in various manners; that called flak fish is dried on poles in the open air, after cutting off the head and splitting it down the back. The round or stock

fish

Commerce. fish is also dried in the air, but is not split. The klip fish is the species of cod called torsk, salted and afterwards dried on the rocks. Wet fish is the salted cod of our markets packed in barrels. The livers of the cod afford a good oil; 400 livers giving a tun of oil, and 200 fish a ton of roes, which are salted.

The herring fishery of the Nordlands, south of the Kunnen, occupies some thousands of persons, between August and the close of the year; but the principal herring fishery is on the south coast of Norway, during the spring and summer.

Mackarel, though abundant, is only salted in small quantities; and the hallibut is almost entirely consumed in the country, either fresh, or cut in pieces, slightly salted, and dried in the air.

The arctic shark is taken for the skin and liver; which latter affords a large quantity of oil. Whales frequently follow the shoals of herrings and other fish into the gulfs; but it is forbidden to molest them, as it is thought they drive the fish towards the shores.

The Norway lobster fishery is very productive, particularly near Stavanger and Mandal, from spring to midsummer. The English and Dutch took off these fish in well-boats, in which they were kept alive to London and Amsterdam. The English to the amount of 20 to 30,000 annually. The rivers of Norway abound in salmon, which salted and smoked, affords a considerable object of export.

The pine timber exported from Norway consists of

of planks, rafters, beams, masts, laths, &c. The Norway planks are more esteemed than those of America or other countries; for the pine trees, growing in a rocky soil, the wood is more firm and compact, and less liable to rot, than that of trees which grow on a fat or sandy soil. The red pine (Scotch fir), and the white pine (Norway spruce), are the two species that afford planks. A great part of the trees are cut in the interior, and, being stripped of their branches, are abandoned to the rivers, which convey them to the fiords, where they are sawed into planks by water mills. More than three-fourths of the export of pine wood is made from the gulf of Christiania, and principally from the town of Christiania, and the three towns on the Dram, which have but one custom-house. Commerce.

The following statements will shew the value of the Norwegian fisheries and timber trade:—

(1790.) Value of fish exported from Norway.

	Rix dollars		*Rix dollars*
Bergen	958,000	Produce of Nordland & Finmark fisheries	1,033,000
Drontheim	75,000		
Christiansand	78,000	Produce of Norway proper	130,000
Molde	10,000		
Stavanger	22,000		
Southern ports	20,000		
			1,163,000

Commerce.

(1799.) Cargoes of fish exported from Norway.

	Carg.	Lasts.		Carg.	Lasts.
To Great Britain	21	447	To Embden	41	913
To Mediterranean (Italy)	48	1,939	To Hamburg	3	139
To France.....	31	912	To Bremen	3	237
To Spain	41	146	To Bruges	1	22
To Holland	4	113	To Portugal.....	1	10
To various parts of the Baltic	61	1,000	To Maideira.....	1	35
				256	5,913

Quantities of timber exported from Norway.

	(1797.)		(1799.)	
	Carg.	Lasts.	Carg.	Lasts.
To Great Britain	63	2,673	964	77,222
To France	73	4,106	71	3,561
To Holland	156	14,662	20	2,176
To the Belgic provinces	15	720	2	127
To Spain	1	72	11	608
To Portugal	2	109		
To Naples			1	84
To German ports			100	7,717
	310	32,342	1169	91,485

In 1799, Norway had 747 merchant vessels, above ten lasts belonging to it; and it can furnish about 14,000 excellent seamen.

THE BALTIC.

General Geographical, and Physical View of the Baltic.

General Plan.

Progress of the geography of the Baltic.

It has been supposed that the antients were acquainted with the Baltic, under the names of Oceanus Suevicus and Oceanus Sarmaticus; but these denominationss are employed by the writers of antiquity in so vague a manner, that they are as applicable to other masses of the waters of the north, or even to the whole mass of these waters, as to the Baltic. The Greeks and Romans had but very superficial knowledge of the north of Europe; hence the description left us by their geographers are extremely obscure, and define neither the limits of the lands or seas. The voyage of Pytheas, supposed to have been performed in the second or third century before the Christian era, the military expeditions of the Romans, perhaps also the commerce of amber, spread some partial notions, but could not rectify all the errors of the geography of the north, which continued to be enveloped in a darkness, that has only been gradually dissipated in the succession of ages by political and commercial revolutions.

Pomponius Mela, indeed, seems clearly to indicate the Scagerack and Cattegat in his description of the Sinus Codanus, so named, according to him,

General View. Progress of the geography of the Baltic.

him, from a neighbouring country called Codanonia. "This extent of waters, says he, has not the appearance of a sea. The waters penetrate into the lands on every side, and often rising above the shores spread themselves vaguely like rivers; circumscribed by islands little distant from each other, they advance, narrowing like an arm or strait, and then curving take the arched form of a long eye-brow."

Ptolemy mentions the Venedecus Sinus, supposed to be the Frisch Haf, and also names several rivers towards the east; but, with the exception of the Vistula, not one of them has been clearly identified by modern commentators.* The same geographer also gives some notions of the Cimbrick Chersonesus, of the Danish islands, and of Schonen, which though far from precise, are more satisfactory than the vague observations of other antient authors. It is, however, pretended by some, that these passages found in Ptolemy are the interpolations of more modern times, many additions of this nature having been clearly discovered in his geography.

The invasion of the Barbarians produced a strange mixture of races and manners, from which resulted a state of society, whose disorder was necessarily accompanied by ignorance and apathy. Neither the victors nor the vanquished thought of profiting

* The Chronus of Ptolemy is supposed by Gosselin, &c. to answer to the Pregel, his Rhubon to the Niemen. Turuntus to the Windau, and Chesinus to the Pernu or Duna.

profiting by this great moral convulsion to acquire a knowledge of geography, and the writers of these ages were almost as little instructed in the state of the globe as the antients. At length Charlemagne appeared, and from a new political order resulted new means of instruction. The expeditions of this prince towards the north, afforded the first opportunities of observing that part of Europe, and from the Rhine and the Weser the limits of its geography were now extended to the Elbe and the Baltic. Eginhard, in his relation of the wars of Charlemagne, first mentions this Mediterranean in detail; nevertheless he was unacquainted both with its extent and figure, and in a public act of the same period, it is designated vaguely by the name of the Barbarian Sea, into which empties itself a river called the Peene.

Alfred, who more deservedly than Charlemagne acquired the sirname of Great, in the midst of the darkness of the age, cultivated the sciences and particularly geography. To him two travellers, Wulfstan, an Anglo Saxon, and Other, a Norwegian, presented the relations of their voyages and travels in the north, which Alfred had published in the Anglo Saxon language. Though these narratives are short and sometimes obscure, owing chiefly to the names they gave the countries and the people they visited, the principal positions and grand divisions are clearly indicated. In them the Baltic is called the East Sea,* its de-

* Austur saltr, or eastern salt-water.

General View. Progress of the geography of the Baltic.

nomination among the antient Scandinavians, and which is still retained by their descendants, as well as by the Germans and Dutch.

The pious desire of converting the still Pagan nations to Christianity was highly favourable to the extension of the geography of the north. Braving every obstacle in this holy pursuit, missionaries penetrated even to the limits of Lapland, and from their observations, combined with his own, Adam Canon, of Bremen, in the eleventh century, compiled a description of these countries. But though his account of the south coasts of the Baltic is tolerably correct, he loses himself as he advances north, representing Scandinavia, or Sweden and Norway, as a group of islands, and placing towards the pole, the Amazons and other fabulous people of the antients. In his work is first found the denomination of the Baltic, whose etymology has given rise to much diversity of opinion. The Swedes derive it from the Scandinavian word Baelt, a girdle, because its waters encircle the land. The Prussians from the Sclavonian or Lettonian Balt, white from its being frozen a part of the year, or from Baltus, one of their kings; and others from Baltia, the name of an island mentioned by Pytheas. The most probable derivation, however, seems to be from the Teutonic Belt, an irruption of the waters, and which is still preserved uncorrupted, in two of the straits by which the sea is entered.

In the twelfth century the Bremeners pushed their commercial

commercial voyages as far as the Gulf of Livonia, and the Swedes at the same period navigated in the Gulfs of Bothnia and Finland; but although these expeditions served to rectify some of the errors of the missionaries, the details of the coasts still remained very imperfect, and it was not until the commencement of the eighteenth century, that those of the Gulf of Bothnia were correctly delineated on the charts.

General View.

Progress of the geography of the Baltic.

The Baltic is entered from the British or North Sea, by the Scagerack, Cattegat, Sound, and Great and Little Belts. The Scagerack extends from Cape Lindesnes (or the Naze of Norway) and the N.W. point of Jutland, to the Gulf of Gothenburg and the north point of Jutland, or Scagen Point, called by the English seamen the Scaw. The reef which surrounds this point gives its name to the Scagerack, which, where narrowest, is nineteen leagues broad.

Entrances of the Baltic.

Scagerack.

The Cattegat * extends from Gothenburg and the Scaw to the Sound and Belts; its navigation, as well as that of the Scagerack, is difficult and dangerous, from shoals and strong variable currents.

Cattegat.

The Sound † is the channel between the coast of Sweden and the island of Zealand; its entrance from the Cattegat is between a mass of rocks on

Sound.

* A compound Dutch word, signifying literally Cat-Channel.

† In Danish and Swedish, Ore Sund; Ore shoal and sandy near the shores.

General View. Entrances of the Baltic.

the Swedish shore, named Kullen,* and the N.E. part of Zealand, and it terminates toward the Baltic between Falsterbo, in Sweden, and Cape Stevens, in Zealand. Its breadth where narrowest, between Elsineur and Helsingborg, is 2,840 yards, or nearly one mile and five-eighths, measured on the ice; from hence it widens towards the Baltic, and between Copenhagen and Landscrona it is six to seven leagues. The greatest depth of the Sound, where narrowest, is nineteen fathoms, and the deepest water is towards the Danish shore; the Swedish shore, near Helsingborg, growing every day shoaler from the accumulation of sand. The mails pass between Elsineur and Helsingborg, in each of which towns is an office to receive letters, examine passports, and regulate the passage boats, which are undecked, and worked both by sails and oars.

Great Belt.

The Great Belt, between the islands of Zealand and Funen, is from seven to eight leagues broad, where widest, at the usual crossing places between Corsœr, in Zealand, and Nyborg, in Funen. In summer the passage is made in three to four hours, but the storms in autumn, and the ice in winter, often render it extremely tedious and even dangerous. Fortunately in these cases the little island, Sprogœ, nearly in the middle of the Belt, affords a safe haven to the boats, and accommodation to the passengers, who are sometimes detained here for weeks.

* Kullen, in Swedish, signifies heights of moderate elevation. This point is called by English seamen the *Koll*.

weeks. In hard frosts, when the pieces of ice unite and form islands of some extent, the Belt is crossed partly in small boats and partly in sledges. The coasts of the Great Belt are in general low and indented with numerous bays and roads. The greatest depth is twenty-two fathoms, but the navigation is rendered intricate by many islands and shoals; nevertheless, line of battle ships pass through it with a fair wind. *General View.* *Entrances of the Baltic.*

The Little Belt, between Funen and the coast of Jutland, is not above three quarters of a mile broad where narrowest, between Middelfart, in Funen, and Snoghœ, in Jutland, the usual crossing places; its greatest breadth is about seven miles. The shores are little elevated, and easy of access, for, except some heights near the frontier of Jutland, the lands descend gently to the sea. On the Jutland side are some deep bays, from which it would be easy to cut a communication to the British Sea. The greatest depth in this channel is twenty-seven fathoms; but there are several islands and banks in it which embarrass the navigation; and the currents run through it with rapidity ftom the Baltic. *Little Belt.*

The north and south extremities of the Baltic are situated in the parallels of 65° 51′ and 53° 30′. Its greatest length 240 leagues from Torneo, at the head of the Gulf of Bothnia, to the Island of Wollin. *Extent of the Baltic.*

Several naturalists, and particularly Buffon, are *Its formation.*

General View.

Formation of the Baltic.

of opinion that the Baltic was originally a lake, formed in a vast valley by the rivers of the north, and that the waters at last burst themselves channels through the least compact parts of the land.* Others consider it as a mediterranean formed, at the same time as the other maritime basins, by some great convulsion of the globe. The limits and contours of this sea, says the author of the "Tableau de la Baltique," may have changed in the primitive ages; and indeed it seems probable that it had anciently points of near approach, or even communications with the British Sea through the Cimbrick Chersonesus, with the Black Sea through the low plains of Poland, and with the White Sea by the Gulf of Finland, through some parts of Russia and Finland,† now occupied by lakes and marshes of vast extent, or by a primitive rock, covered with pebbles, rounded by the action of the waters; but these changes having been operated before the memory of history, it is impossible to indicate with any certainty either their causes or their progression.

Gulf of Bothnia.

On the north the Baltic forms the great Gulf of Bothnia, 150 leagues in length. In its entrance is the Archipelago of Aland, forming three channels. The

* As proofs of this opinion are adduced the chain of rocks that cross the bottom of the Scagerack from Jutland to Norway, and which are supposed to be the remains of an isthmus; and the similarity of the substances that form the opposite shores of the Sound, which depote their having been once united.

† Buffon, and other writers after him, by a glaring geographical error, make this communication still exist by the Lake and River Onega, which have no other relation than similarity of name.

The space between the coast of Sweden and these islands is eight or nine leagues wide, and is called by the Swedes the Aland-Haf, or Sea of Aland. The space between the islands and the coast of Finland is named Waltus-Kiftet: it is filled with numerous islands, through which are two channels called Delen and Lapwaesi; and the different islands are separated by tortuous straits from one to four miles broad. The lower part of the gulf, from the Isles of Aland to Umeo, is called by the Swedes the *Sea* of Bothnia. At its northern extremity, between Umeo and Wasa, the channel is narrowed by a multitude of islands and rocks, and forms a strait named Quarken, eight or nine leagues wide; from hence the gulf again widens considerably, and to its head is specially called the *Gulf* of Bothnia. The greatest depth, as far as has been ascertained, is fifty fathoms. General View.

The head of the Gulf of Bothnia approaches the White Sea, but the space which separates them is composed of lofty mountains, through which neither the force of the water nor the industry of man can create a passage. The opinion of the existence of a subterraneous communication between the Sea of Norway and the Gulf of Bothnia, by the Maelström, is founded solely on the exploded idea of marine abysses.

On the east of the Baltic is the gulf of Finland, eighty leagues long, and from eleven to twenty-two broad. Its entrance is between Spinthamer point in Estonia, and Hangoe-head in Finland. The latter point is the extremity of a peninsula, with a fire Gulf of Finland.

General View. tower, and off it several islands, forming a port, defended by some batteries. The greatest depth of the gulf is sixty fathoms; but it is encumbered with a vast number of rocky islands and reefs, level with the water, distinguished by fire-beacons, or flags of different colours, hoisted on high wooden crosses, to superintend which two Russian gallíots are constantly employed, while the gulf remains open; nevertheless, shipwrecks are extremely frequent.

Depth of the Baltic. The general depth of the Baltic, at a certain distance from the shores, is sixty fathoms; but nearly in the middle, towards the S.E. extremity, are two spots with 110 and 115 fathoms. The depths are, however, very irregular, the bottom being in great part composed of chains of rocky elevations, and, in many places, great blocks of granite project their heads above water.

Level. It was long admitted as certain by the naturalists of the north, that the Baltic was considerably more elevated than the ocean; but recent observations made at the locks of the canal of Holstein, prove that their levels are at present generally the same, and that the little differences which may be occasionally observed, are owing to accidental and temporary causes; and, consequently, that the constant current setting out of the Baltic, is occasioned solely by the abundance of pluvial waters it receives.

The

The tides, which are sensible in the Scagerack, begin to diminish in the Cattegat, are very trifling in the Sound and Belts, and entirely cease, or are at least imperceptible in the Baltic. The waters of this sea are, however, subject to irregular elevations; the maximum of which is three feet and a half. These elevations most frequently occur in autumn, when the weather is overcast and threatening rain. Their duration is various, sometimes only a few days, at others several weeks; they are accompanied with a violent agitation of the waters of the gulfs, which occasionally inundate the low shores: they also render the fresh water lakes, that communicate with the sea brackish; and, in lake Maelar in particular, the saltness becomes so great, as to render the water unfit for domestic purposes. The winds which precede, accompany, and follow these elevations, vary in different places. In the gulf of Bothnia, the fall of the waters is usually succeeded by north winds, while, in the vicinity of Stockholm, these winds follow the elevation.

General View. Tides. Irregular elevations.

Various explications have been given of this phenomenon; some ascribing it to strong winds heaping the waters up in the bays and gulfs, and towards the shores: but, in this case, the elevations would always take place in gales of wind, and last while they lasted; while, on the contrary, they often precede a storm, and diminish, or entirely cease before it. Others account for them by supposing a foreign mass of waters to be driven into the Baltic from the ocean by W. and

General View. and S.W. winds; but, in twenty-four hours, the
Irregular elevations. waters rise two feet, and afterwards increase rapidly to three and a half, while it has been proved, by the most exact calculations, that it would require five days to force in through the Sound and Belts a quantity of water sufficient to produce a general rise of two feet, and more than eight days to cause one of three and a half.

Schulten, a learned Swede, feeling the insufficiency of these explanations, has sought another in the state of the atmosphere. In his numerous voyages in, and long residences on, the coasts of the Baltic, he observed, that when the waters are about to rise, the barometer falls, and when they are about to fall it rises; the movements of the water always preceding a little those of the barometer. Hence he conceived, that the phenomenon was produced by the unequal pressure of the atmosphere on different portions of the sea, by which the level of the waters suffers a temporary derangement. The greatest rise of the barometer in the northern parts of Europe, is 26½ inches, and the least 24. The difference, or 2½ inches, answers to 3¼ feet of water; and this is nearly the difference of the elevations of the waters at their extremes. The variations which may occasionally be observed in the height of the elevations, may be ascribed to adventitious, or local causes: thus, at the heads of the gulfs, the waters will sometimes rise above the general maximum, from a continuance of winds blowing into them, or from receiving an extraordinary quantity of fresh water; while,

while, near the islands and rocks in the middle of the sea, the elevation will, at times, be below the maximum: the waters being there less obstructed in their movements. It may also be supposed, that the lunar influence produces tides, which, though too small to be perceptible at other times, contribute to augment or diminish these occasional elevations. The fishermen prognosticate the state of the weather with the greatest certainty, by the rise and fall of the waters, and regulate their excursions accordingly.* General Path. Irregular elevations.

The currents of the Baltic are strong, and are evidently produced by the vast number of rivers and rivulets that empty their waters into it, of which several towards the north rise three times a year: hence it is, that the general currents are propagated in the gulfs of Bothnia and Finland, which receive the most rapid rivers. A strong current sets from the head of the gulf of Bothnia through the strait of Quarken, which grows weaker as it approaches the isles of Aland, which break it into two branches, one of which takes a S.W. direction towards the islands of Gottland and Œland, where it again divides and grows weak. The other branch, in passing among the numerous islands between Aland the coast of Finland, is broken according to the direction of the channels; but reunite near a point, called Kœkar, Currents.

* Similar irregular elevations of the waters are observed in the Caspian sea, and in the Lake of Geneva. Some writers ascribe the latter to the melting of the snows; but Saussure accounts for them by the pressure of the atmosphere.

General View. Currents.

Kœkar, and combine with the constant current out of the gulf of Finland. This united current, strengthened by that from the gulf of Livonia, runs between Courland and the isle of Gottland, to the south of which it combines with the current from the sea of Aland, and with those formed by the rivers of Prussia and Germany; then taking a direction towards the island of Bornholm, which again breaks it, it reunites between Schonen and Rugen, and runs through the Sound and Belts into the Cattegat.

Such are the currents of the Baltic when not affected by extraordinary circumstances; as great falls of rain or snow, which augmenting the volume of the river waters, give the currents a greater degree of velocity, and change their directions. Storms of long continuance also alter the general direction, and produce strong counter currents near the shores. When S.S.W. gales blow in the British sea, they force a body of waters into the Scagerack, producing a current, which sometimes predominates over that from the Baltic. This cause is most powerful when strong N.W. winds have previously driven the waters of the Norwegian sea into the gulf of the Elbe, where being opposed by the land, and meeting the S.W. wind, they are driven back to the E.N.E. into the entrances of the Baltic, and create a retrograde current, that is sometimes felt even to the gulfs of Bothnia and Finland.

There are said to be in the Sound superior and inferior currents, in contrary directions, which were

were first observed by some Englishmen, who being in a boat in the middle of the channel, found her drift out towards the Cattegat, with the superficial current; but, having let down a bucket with a large shot to the depth of four or five fathoms, she became stationary; and, on sinking it deeper, she was found to drift inwards against the current. The observations of several Swedish naturalists seem to establish the fact of these different currents. General View. Currents.

The sudden changes of wind, the irregular and little depths, and the strong currents of the Baltic, render its waves short, broken, and confused, consequently more disagreeable, and often more dangerous to small vessels, than the higher, but longer, and more regular waves of the ocean. At the north extremity of the island of Bornholm, the currents rushing over a circular cluster of submerged rocks, produce a violent agitation of the waters, or kind of whirlpool, called by the Swedes, *Malt-quœrn*, or the grinding-mill. There are also three spots of the gulf of Bothnia which present similar phenomena. Waves. Whirlpools.

The waters of the Baltic are, throughout, much less salt than those of the ocean; but the degree of their saltness varies considerably, according to locality, season, winds, &c. Thus S.W. and W. winds augment the general saltness, by introducing the waters of the ocean, while N.E. and E. winds diminish it for an inverse reason. In the summer it requires 300 tons of the water of the gulf Saltness.

General Phen. Saltness. gulf of Bothnia to give one ton of salt, and in winter only fifty tons; a difference caused by this gulf receiving, in winter, much less fresh water, as well as by the effect of congelation. In general, however, the waters contain from the $\frac{1}{30}$ to the $\frac{1}{40}$ part of their weight of salt.

Meteors. The most common aqueous meteors in the Baltic, are rain, snow, and fogs; dews and hail are very uncommon. In summer, and particularly in July, a meteor, peculiar to the north, is observed in this sea; it is a kind of dry fog, sometimes extremely dense, at others so thin as to admit the passage of the sun's rays, which reflect a variety of brilliant colours on the water. The Swedes call it sol-rock, sun-smoke. A meteor similar to the *fata morgana* in the Strait of Sicily, is also observed in the Baltic. At the entrance of the archipelago, in the channel to Stockholm, is a band of rocky eminences, called the Swedish Heights: the fishermen that frequent this spot in summer, often see, opposite to it, rising out of the sea, another similar ridge; and ascribing this appearance to a miracle of Gunilla, the goddess of the sea, they have given these fantom rocks the name of Gunilla's Ears. Pontoppidan, searching for proofs of the existence of the kraken, caught at the reports of the Swedish fishers, and concluded, that these apparent rocks were protuberances of that animal's back projected above water. A Swedish engineer, employed in surveying, has latterly observed and accounted for this phenomenon more satisfactorily, attributing it to a peculiarly

a peculiarly composed cloud, which reflects the image of the Swedish heights. General Remarks. Meteors.

In the gulf of Finland, a particular phenomenon attracts the notice of seamen: ten leagues from Hangœ Head, and four from Ekenaes, is an island named Jussari, surrounded by islets and rocks, between which, at a place called Segerstern, the compass needle is observed to lose its polarity, and to fly all round. This is probably produced by veins of iron, or loadstone in the rocks, though some Swedish writers ascribe it to a cargo of iron formerly sunk here.

The Baltic receiving the full influence of the cold east winds from the frozen regions of Siberia, as well as from the little saltness of its waters, and their movement in winter being diminished by the freezing of the rivers, cedes more easily to the action of cold, than parts of the ocean considerably farther north; and while the Scagerack and the gulfs of Norway remain open to navigation in the most rigorous winters, several portions of the Baltic are covered with ice in a very moderate degree of cold. Generally at the latter end of December the bays and channels are encumbered with ice, and often entirely frozen. The waters near the shores, towards the heads of the gulfs of Bothnia and Finland, are first congealed, and the masses of ice are conveyed by the currents to the south, until by the increasing cold they are united into vast fields, which become stationary on the west towards Stockholm, and on the east towards the islands of Dagœ and Œsel.[P4] Ice.

The

Great Frosts. Ices.

The clearing of the forests, and the progress of cultivation, seem considerably to have diminished the rigour of the climate in the Baltic. The years 1383, 1399, 1408, 1423, 1429, 1459, and 1658, are noticed in the annals of the North for the intensity of the cold, and the great extent and solidity of the ice in this sea. In 1408 the Cattegat was frozen across, and the wolves passed on the ice from Sweden to Denmark. In 1658 the Belts were frozen over, and gave occasion to one of the most remarkable enterprises recorded in history. Frederick the Third, of Denmark, had declared war against Charles X. of Sweden, who was then fighting in Poland, near 1000 miles from Copenhagen; Charles marched with the rapidity of lightning into Germany, forced his way through Holstein and Sleswick, and arrived on the shores of the Little Belt with an army of 20,000 men. The moment he perceived the icy plain before him, he conceived the bold idea of passing his army over it; but first assembled his generals, and demanded their opinions. All objected to so desperate an attempt, except the brave Dalberg, who replied that, though the enterprise was hazardous, he would answer with his life for its success. The troops were ordered to advance in columns, with their horses, cannon, and baggage, and the king and Dalberg marched at their head. After repulsing several detachments of Danes on the ice they entered Funen; at the opposite extremity of which Charles saw the Great Belt also frozen over, and again, contrary to the remonstrances of his generals,

Gustavus, determined to continue his route, but instead of crossing direct from Funen to Zealand, where the breadth of the channel, and the rapidity of the currents, rendered the solidity of the ice doubtful, he marched by the islands of Laland, Langeland, and Falster, still skirmishing with the Danes, who could not prevent his reaching Zealand, and marching direct to Copenhagen, under whose walls he obliged Denmark to purchase a peace with the loss of several provinces. From this memorable event to the year 1709 the winters of the Baltic have not been extraordinary severe; in this year the ices formed on the coast of Prussia were so extensive, that their limits could not be distinguished from the highest towers. In 1809 the entrance of the Gulf of Bothnia was so firmly frozen, that the Russians prepared to attempt an enterprise similar to that of Charles X., and several detatchments of their troops had already crossed from Finland to the Isles of Aland on the ice to invade Sweden, when the revolution in this latter country produced an armistice that was followed by peace.

General Phenomena. Ices.

The variations of temperature, the force of winds, the currents, and irregular elevations of the waters, produce various effects on the ices. Holes are sometimes formed from which the water spouts up and is congealed in the form of stalactites; sometimes the ice is rent for considerable extents, resembling furrows made by the plough. The ices near the shores often experience a sudden commotion from the elevation of the waters, by which

General View. — Ices.

they are split with great violence and noise, launching large masses fifty feet into the air, and affecting the neighbouring shores so forcibly as to tear up trees and remove large stones.

The mode of travelling on the ices in sledges is singularly striking to a southern traveller. Acerbi thus describes a journey of this kind across the Gulf of Bothnia by the Isles of Aland, which is the great thoroughfare from Sweden to Finland and Petersburg. "The ice," says this traveller, "which near the shores is smooth and even, becomes more and more unequal and rugged, assuming, as we proceeded, an undulatory appearance, resembling waves arrested and fixed by the cold. At length we met with masses of ice heaped one upon another, some seemingly suspended in the air, while others were raised in the shape of pyramids; in short it was an immense chaos of icy ruins, presented to the view under every possible form, and embellished by superb stalactites of a blue-green colour. Amongst this confusion it was not without difficulty that our horses were able to find their way, and to draw the sledges. It was necessary to make frequent windings and to follow the direction of a frozen wave, in order to avoid a collection of icy mountains that lay before us. During the whole journey we did not meet on the ice one living creature; and the dead silence was only interrupted by the whistling of the winds against the prominent parts of the ice, and sometimes by the noise produced by the severing of these parts from the general mass." A journey made

made by the same traveller at the commencement of spring, on the ices along the east shore of the Gulf of Bothnia, gave rise to the following observations: "The frost is so intense in winter as to arrest the sea in its waving motion, but as the sun becomes powerful with the advancing season, the surface of the ice melts, and the water runs into the cavities or hollows, forming little pools or rivulets two or three feet deep. In the night the surface of these pools is again frozen, and the water becomes enclosed between two plates of ice; the sledge passing over the upper crust, which is thin, breaks it, suddenly sinks into the water and terrifies the inexperienced traveller who is ignorant of the cause. Disruptions of the ice also frequently oblige the traveller to lose sight of the coast, while the whirlwinds of snow in their fall cover the beacons planted to mark the route, and obliterate the traces of the sledges that went before. These dangers are however compensated in fair weather by appearances equally novel and interesting; when the air is calm, and the atmosphere, free from fog, permits the penetration of the sun's rays, the most varied colours are reflected from the ice, and the imagination thinks it sees the magic power of genii and fairies. The carpet of snow is sewn with rubies and pearls; the ices take the form of christal palaces and enchanted castles; and towards the limits of the horizon, the vault of heaven is decorated with purple clouds. The Finland fishermen, scouring over the ice on long wooden scates, and steering themselves with a

General View. Ices.

General View. Ices.

pole, are also interesting objects. When they stop to fish, they make a hole in the ice with an iron chisel, let down their hook to the depth of thirty feet, and are in general successful. While thus stationary they shelter themselves from the wind by a little triangular sail which they carry for this purpose.

Atmosphere.

The difference of temperature in the various parts of the Baltic is very considerable: the medium of the thermometer throughout the year at Uleaborg is 29°, or 3° below freezing point; at Stockholm the medium is $42\frac{4}{5}$°, or $10\frac{4}{5}$° above. In the southern parts of the sea the ices begin to break up in April, but the Gulf of Bothnia and Finland often remain closed till the month of May. The winds are extremely variable in this sea, but are most commonly from the east in the spring, and from the west in autumn. Calms are seldom experienced except in the middle of summer.

Diminution of the Baltic.

The question of the continual diminution of the waters of the Baltic, which long divided the learned of the north, seems to be now decided in the negative. According to the supporters of the hypothesis, this sea will cease to communicate with the ocean in less than 2,000 years; and long before that period its navigation will be circumscribed within very narrow limits. The chief facts brought forward in support of the diminution are the marks traced on several rocks in the Gulf of Bothnia, which indicate a decrease of near two inches a year; and the remains of vessels found at consi-

derable

derable distances from the present shores, and even on considerable heights. To the first the opposers allege, that there is no certainty of regard having been paid to the temporary elevations of the waters; besides, the rocks on which the marks were traced, are too near the shores, and the solidity of their bases is too uncertain to allow them to be considered as incontrovertible proofs of the general hypothesis: for it is well known that the disruptions of the ices often raise the rocks and cause them to change situation. As to the vessels, as we have already observed, they may be the monuments of inland navigations which no longer exist; besides, it is well known that in the middle ages the northern heroes, or rather piratical chiefs, were interred in their ships with their most precious effects. The identity of many ancient names of places with their modern denominations, the resemblance of the coasts at this day with the most ancient descriptions of them, and the absolute silence of the Scandinavian poems and traditions, with respect to any material alteration produced by the retiring of the waters, are also adduced as sufficient proofs of the stationary level of this sea. The variations which take place in the appearance of the coasts must therefore be ascribed to causes which alternately make the waters encroach on and recede from the shores; such in particular is the general direction of the currents, which being from north to south, force the waters against the coast of Prussia and Germany, producing inundations that wash away the shores and form the sand-

General View.

Diminution of the Baltic.

General View. banks that border these coasts. It seems, how-

Diminution of the Baltic. ever, natural to conclude that the great destruction of timber on the coasts of this sea, and the progress of cultivation, which by rendering the atmosphere warmer, increases the evaporation, must have progressively decreased the quantity of pluvial waters conveyed to it; whence it will follow that its level, formerly a little higher than that of the ocean, has gradually lowered: and if the same causes continue to increase, the effect must increase also, until the evaporation exceeding the quantity of waters restored by rivers and meteors, instead of a constant current setting out, produced by the superabundance of these waters, a current will run in from the ocean to preserve the general level.

Marine plants. The Baltic, though far less rich than the ocean in organized nature, possesses a variety of plants and animals of a certain utility to the inhabitants of its costs. Among the marine plants are observed several fuci ulva and confervas.* The fuci are used to manure the land, particularly in the islands of Gottland and Œland, on whose shores they

* Fucus Serratus Sea wrack
Vesiculosus Bladder wrack
Fustigiatus Short forked fucus
Ulva Intestinalis Gut laver
Compressa Flat laver
Conferva Littoralis Olive sea conferva
Polymertha Palmate conferva
Rupertis marina } Rock conferva or sea bread
Zostera Maretima grass wrack

they are washed up in great quantities, and the ulvas are eaten by the poor. General View.

Coralaginous substances are met with in several parts of the Baltic, and particularly in the port of Capelshamn, in the island of Gottland, where there are vast beds of madripores, millepores, &c. Linnæus, however, who describes these substances, does not tell us whether the animals that form them still exist; it is, however, probable their formation is anterior to some revolution which changed the climates of the globe. Some holuthurias and medusas are also observed in this sea, particularly towards the south. Zoophites.

Oysters are abundant in the Cattegat, and round the island of Lessœ, but the attempts to transplant them to the north coast of Zealand have been unsuccessful. Muscles are more extended, and the finest are found in the gulfs of Kiel and Apenrade, where they attach themselves to piles driven near the shores. Some tellines, helices, nereites, and sepias, complete the list of mollusca. Molluscs.

Lobsters are plentiful in the Cattegat but do not enter the Baltic; small prawns are found in various parts of this sea, particularly in the belts and near Sœder Telje, a short distance from Stockholm. According to modern ichtiologists, the Baltic and its rivers possess twenty-eight genera of fishes, comprising sixty-one species, of which the following table offers a general view. Crustaceous. Fish.

Genera.	*Species.*	*English Names.*	*Genera.*	*Species.*	*English Names.*
Petromyzon	Marinus	Lamprey	Trigla	Gurnardus	Grey gurnard
	Fluviatilis	Lesser lamprey		Hirundo	Tub fish
Raia	Batis	Skate	Mullus	Ruber	Red surmullet
	Clavata	Thornback		Surmuletus	Surmullet
Squalus	Pristis	Saw fish	Cottus	Gobia	Bull head, or miller's thumb
	Glaucus	Blue shark			
	Acanthias	Dog fish		Scorpius	Father lasher
Lophius	Piscatorius	Toad fish		Cataphractus	Pogge
Acipenser	Sturio	Sturgeon			Four horns
	Ruthenus	Sterlet	Pleuronectes	Hippoglossus	Hollibut
Cyclopterus	Lumpus	Lump fish, sea owl, or cock-paddle		Maximus	Turbot
				Platessa	Plaise
Syngnathus	Typhle	Sea needle		Solea	Sole
	Ophidion.	Sea adder		Flessus	Flounder
		Trumpet fish		Limanda	Dab
Ammodytes	Tobianus	Sandeel or lance		Passer	Whiff

Xiphias	Gladius	Sword fish	Perca	Fluviatilis	Perch
Anarrhicas	Lupus	Sea wolf	Clupea	Harengus	Herring
Blennius	Gunellus	Butter fish		Harengus minor	Pilchard
	Ovi-viparous			Sprattus	Sprat
Trachinus	Draco	Weaver		Alosa	Shad
Gadus	Pollachius	Whiting pollack		Encrasicola	Anchovy
	Merlangus	Whiting	Cyprinus	Carpio	Carp
	Minutus	Poor or Capellin		Aphye	
	Callarius			Ide	
Gobius	Niger	Sea-gudgeon or rock-fish	Salmo	Salar	Salmon
				Trutta	Salmon trout
Schomber	Schombrus	Mackarel	Osmerus	Eperlanus	Smelt
	Trachurus	Horse mackarel	Corregonus	Thymallus	
Gasterosteus	Aculeatus	Stickle back		Lavaret	White trout
	Pungitius	Less stickle back	Esox	Lucius	Pike
	Spinachia	Great sea stickle back		Bellona	Horn, or gar fish

General Fish. The sea lamprey inhabits the bottom of the sea all the year, the river lamprey only quits the fresh waters in spring. These latter are most abundant in the rivers of Pomerania and Sweden.

The two species of rays found in the Baltic are most common on the coasts of Denmark, the south of Sweden, and Germany.

The saw fish is only an occasional and very rare visitor in the Baltic; the blue shark and the dog fish, are habitual residents.

The toad fish is chiefly met in the Sound, where it finds abundance of small fishes for food.

The sturgeon is most abundant in the Frisch Haf and towards the mouths of the Vistula and Oder. Near Pillau there is so profitable a fishery of them, that a crowned sturgeon forms the armorial bearings of this city. The fishing seasons are March and April, August and September. The sterlet is only occasionally seen in the Baltic, and as it is not a native of the rivers which empty themselves into it, it has been supposed, that those met with are individuals escaped from boats descending from the Wolga, and dashed to pieces in the falls of the Msta.

The sword fish frequently enters the Baltic, but does not appear to multiply there.

The great Newfoundland cod does not enter the Baltic, and the species called Gadus callarius or Balticus never quits it. The whiting is very rare.

The sea gudgeon is most abundant in the gulf of Kiel and neighbouring waters.

The

The mackarel of the Baltic is less than that of the British Sea, and is most abundant on the coasts of Germany and Denmark. Cantabrian Fish.

The red surmullet is scare in the Baltic, the sur-mullet more common.

The father lasher, in Danish ulke, sometimes almost encumbers the port of Copenhagen. The four horns is spread all over the Baltic.

The holibut is met with in the Cattegat, but does not enter the Baltic. The other species of pleuronectes, mentioned in the table, are abundant on the coasts of Jutland, Denmark, Germany, and Prussia; from whose ports considerable quantities are exported, salted and smoked.

The river perch frequents the bays of this Baltic; the finest are taken in the channels to Stockholm.

The herring of the Baltic is smaller than that taken in the Scagerack and Cattegat, but equally well tasted. These fish remain all the year in this sea, but during the winter they keep in the deep water, and only appear in shoals on the coasts in spring, a part of the summer, and autumn. They also change stations, quitting certain parts of the coasts either for a time or for eves, and frequenting others. At present the principal fisheries are in the gulf of Gothenburg, off Kullen, and round Zealand; and in the gulfs of Limford, Flensburg, and Slie. The fish generally arrive in these parts in March and remain till May. In autumn they appear on the coast of Pomerania, particularly near Rugen.

The

General View of the Fish.

The species of herring called in the north strœming or strœmling, and by us pilchard, abounds in the Baltic, and particularly in the gulfs of Bothnia and Finland, in the bays of which they arrive in shoals in spring and autumn, but are taken at all seasons at a distance from the shores. The annual produce of all the pilchard fisheries is estimated at three hundred thousand tons at least, which is entirely consumed in the Baltic, forming a considerable portion of the food of the lower classes. The Baltic also possesses in the genus of clupea, the sprat, the shad, and the anchovy, but the two latter are rare. Sprats are found in greatest abundance in the waters of Holstein and in the gulf of Riga, where the inhabitants cure them in the same manner as anchovies.

The carp is sometimes found by the fishers in their nets, but as this fish is not indigenous in the countries bordering on the Baltic, but being naturalized in the fresh waters of Prussia, these individuals are supposed to have escaped from vessels conveying them from Konigsberg to Stockholm and Petersburg. The cyprin ide is also seen but rarely in the Baltic, and only in some bays which receive rivers, particularly that of the great river of Dalecarlia.

Salmon ascend the rivers of the Baltic from April to June, according as they are situated towards the north. On the south they are most abundant in the Oder, Vistula, Duna, and Narowa; on the north in the Motala, Dalecarlia, Uleo, Kemi, and Torneo, and in the Kymen, in

ascending

ascending which latter, as well as the Dalecarlia and Motala, they are obliged to leap considerable falls. The salmon trout is also taken in some bays of the Baltic. General Flora. Fish.

Smelts are very common on the coasts of Sweden and Prussia, where considerable quantities are dried for commerce.

The lavaret, or whitish trout, ascends the rivers in spring and summer to spawn, but as it devours the greater part of its eggs it is but scantily multiplied. It is most plentiful in the gulf of Bothnia, and the Finlanders prepare caviar from its roe, but of a much inferior quality to that of the sturgeon. The corregonus thymallus is chiefly met with towards the north, and particularly in the rivers of Finland.

The horn, or gar fish, is common in several parts of the Baltic, and the pike descends the rivers to the bays, and is salted and dried in considerable quantities.

The greater cetaceous animals very rarely enter the Baltic and only by accident. In 1811, a black whale of the largest size was seen near the gall-stream, in the Gulf of Bothnia. Of the lesser species, the common porpoise (delphinus phocena) is the only one that lives habitually in this sea, and at Middlefart, in Funen, is a company which enjoys the exclusive privilege of taking it. Cetaceous animals.

The only amphibious animal of the Baltic is the common seal (phoca vitulina), of which it has two varieties, one the size of a young ox, of a fawn or grey colour, the other much smaller, and Amphibious.

of

General View. Amphibious animals.

of various colours, grey, fawn, black, and tygered; the first keep at a distance from the land, and bring forth their young among the ices, while the second resort to the shores and bring forth on the rocks. The people of the Baltic having superior and more certain resources for subsistance, both from nature and their own industry, hunt the seals chiefly for their oil, and this only towards the north, for in the other parts they are allowed to multiply to a troublesome degree. In the months of March or April, the peasants of the Isle of Gottland, and of the islands in the Gulfs of Bothnia and Finland, form companies and set out in sailing boats attended by skiffs, and provided with harpoons, clubs, and musquets. They are often a month absent, living chiefly on the flesh of the seals, and bringing home their fat and skins. The profit, however, by no means compensates the danger and fatigue of these expeditions, thirty to forty shillings a head being the utmost dividend of the most successful. By a law of the middle age, the tithe of the seals killed by the Alanders was paid to their clergy, for the repairs of the churches and the exercise of hospitality.

Aquatic Birds.

Naturalists reckon thirty-eight species of aquatic birds, as frequenting the Baltic, some of which remain the whole year, while others disappear after having reared their young. The following table gives a view of them, and of some other species that frequent the coasts.

Genera.	*Species.*	*English Names.*	*Genera.*	*Species.*	*English Names.*
Pelecanus	Carbo	Corvorant	Anas	Clypeata	Shoveler
	Graculus	Crested Shag		Penelope	Wigeon
Sterna	Hirundo	Great Tern or Sea Swallow		Bernicla	Brent Goose
	Nigra	Black Tern		Glaucion	Morillon
	Procellaria			Alandica	Aland duck
Larus	Canus	Common Gull or Mew	Colymbus	Areticus	Great Northern Diver
	Glaucus			Septentrionalis	Red-throated Diver
	Marinus	Great black & white Gull		Cristatus	Great Crested Grebe
	Fuscus	Herring Gull		Auritus	Lesser do. or Dob-chick
	Tridactylus	Tarrock		Grylle	Black Guillemot
	Parasiticus	Arctic Gull	Alca	Torda	Awk
Anas	Cygneus	Wild Swan	Mergus	Merganser	Gooseander
	Nigra	Scoter or black Diver		Albellus	Smew or white Nun
	Fusca	Velvet Duck		Minutus	Red-headed Smew
	Tadorna	Sheldrake or Barrow Duck		Serrator	Lesser Dun Diver
	Boschas	Mallard	Scolopax	Gallinago	Snipe
	Hyemalis	Long-tailed duck	Tringa	Vanellus	Lapwing
	Ferina	Pochard or Dun Bird	Charadrias	Hiaticula	Sea Lark
	Marila	Scaup Duck	Avocetta	Recurvirostra	Avosetta
	Crecca	Teal	Hœmatopus	Ostralegus	Sea Pie
	Anser	Grey leg wild Goose	Falco	Haliœtus	Osprey
	Molissima	Eider Duck		Albicilla	Eure
	Fuligula	Tufted Duck			

General View. Aquatic Birds.

The swan, the eider duck, and the genus of gulls, are those alone of the aquatic birds, which offer any thing worthy of more particular notice. The swan frequents many parts of the Baltic, but particularly the Sound, where it is forbidden to molest it except on festivals and by permission. The hunting of this bird was formerly one of the amusements of the Kings of Denmark, and its feathers are still paid as a tribute to the governors of the province of Schonen, by certain vassals.

The eider duck, though its true country is farther north, is found in the Baltic in considerable numbers. It constructs its nest chiefly in the elevated precipices of Gottland, in the crevices of the rocks of Bornholm, and among the steep mountains that line the gulf of Bothnia. The chase of it, and the collecting the down from the nests, are regulated by strict laws, in order that the species may not be diminished.

Various species of gulls abound in the Baltic, chiefly towards the south and more particularly about the Danish peninsula. In the gulf of Slie, is an island called Meveberg, gull mountain, which is one of their breeding places, and while they are thus occupied a guard is stationed on the quay of Sleswick to prevent all communication with the island. About the end of June, a general chase is permitted, which constitues one of the annual feasts of the Sleswickers, and is announced by the firing of three muskets.

General Aspect of the Coasts of the Baltic, Rivers, and Inland Navigation.

South coast of Norway and Sweden.

The Swedish shores of the Scagerack and Cattegat are high, and present a succession of promontories and rocks, some cloathed with wood or cultivated, others naked and abandoned, on the whole having a most rugged and dreary appearance, particularly near Marstrand, where the shore is composed of steep rocky heads, against which the sea beats with unceasing fury. The coast of Schonen offers a line of plains, and a shore free from rocks, but with the exception of the ports on the sound, the roads for shipping are all, more or less, exposed; the best are those of Trellebourg, Ystad, Cimbrishamn, and Ahus. The Swedish coast, from Blekingen to the Gulf of Bothnia, is lined with islands and rocks, and broken into a great number of gulfs and bays, forming safe ports but of difficult access, and visited only by coasting vessels. Although these shores are naturally barren and savage, the industry of man has in many places overcome the defects of nature, and spread a smiling cultivation among arid mountains and heaped up rocks. Both shores of the Gulf of Bothnia are rugged and broken; and that of Sweden, in particular, is so elevated as to form an alpine ridge lining the shore.

Coasts of the Gulf of Bothnia.

Danish Peninsula.

The north and east coasts of Jutland are generally low, and the northern extremity of the peninsula is composed of barren sands, which are

General Aspect of the Coasts. Denmark.

conveyed in whirlwinds to considerable distances, and often cover large cultivated tracts. In order to fix these sands a variety of shrubs and herbaceous plants, particularly the elymus arenarius,* are sown. The peninsula is traversed nearly in its whole length by a ridge of sandy hillocks resting on a bed of rock incapable of culture, and producing only heath and coarse grass. The greatest of these elevations do not exceed a few hundred feet, but they command an extensive view of the British sea and Baltic. The east coasts of Sleswick and Holstein descend gently to the sea and are highly cultivated.

The numerous gulfs and bays on these coasts form ports, of which several are important to commerce, and have given birth to flourishing cities and towns. The first of these gulfs towards the north is the Limfiord, which nearly divides the peninsula of Jutland, being separated from the British sea only by the sandy isthmus of Agerland three or four miles broad. It forms a great many windings, which make its whole length eighty miles. Its entrance is two miles wide, but is obstructed by sands which encrease yearly, and by masses of granite which project their heads above water. Its greatest depth is twelve feet, and vessels above that draft are obliged to discharge at Hals: small craft go up to Lœgstœr, above which the gulf is only navigable by praams. Jutland has also the Gulfs of Mariager and Randers

* Sea lyme grass, or quick grass.

Randers, the Bays of Ebletoft, Kaloe, Horsens, and Weile. In Sleswick are the Gulfs of Colding, Flensburg, and Slie, which latter resembles a great river, and the Ekernefiord; Holstein has the Gulf of Kiel, the Bay of Colberg, and the Gulf of Lubeck. *General Aspect of the Coasts.*

After passing Holstein the German coasts become low and sandy. The beaches are in general composed of fragments of pyrites, jasper, porphyry, and granite, rounded by the action of the waves, and which in some parts are so heaped up as to form a kind of causeways or dikes, of which the most considerable is that of Dobberan, in Mecklenburg, called the Holy Dike, from the popular tradition of its having been formed by supernatural agency; it is a league in length, one hundred feet broad, and has an elevation of five to six feet above the level of the sea. Some parts of these coasts also present chalky cliffs; and throughout their whole extent they are lined by shoals. *Mecklenburg.*

The coast of Pomerania and the islands off it exhibit the constant action of the waters in their numerous bays and gulfs. On the west the peninsula of Dars and the island of Zingst form the basin called des Dars, which has six feet depth. Farther east the island of Rugen is separated from the continent by the Strait of Gellen, from one and a quarter to fourteen miles broad: the eastern entrance is called the Bodden and is navigable by the largest vessels, while in the narrows the depth is but three to four fathoms, and requires *Pomerania.*

General Aspect of the Coast.

to be constantly cleared of the sand that accumulates in it; to defray the expences of which all vessels passing through it pay a toll. The islands of Usedom and Wollin form the great bason called the Gros Haf, whose waters are generally fresh, but become brackish in northerly winds. It is well supplied with fish and has three outlets, named the Peene, the Swine, and the Divenow. The ports on these coasts require to be constantly freed from sand, while the action of the sea is sometimes so violent as to wash away the strongest dikes and moles in a few hours; so that the labour of twenty years has only partially succeeded in protecting the port of Swinemunde from the ravages of this element.

In prolonging the coast of Pomerania we look in vain for the ruins of the celebrated Vineta, the supposed capital of the Vandals. The inhabitants of the country indeed point out a spot near the isle of Usedom, where they pretend they are to be discovered under water, but on close examination these ruins are found to be merely rocks, to which fancy has given the shape of columns, walls, &c. A recent writer believes the town of Julin, in the island of Wollin, to be the antient Vineta, and which the writers of the middle ages have described in so exaggerated a manner, as to lead modern commentators astray.

Prussia.

Beyond the eastern limits of Pomerania is the Gulf of Dantzick, the western extremity of which, called the Gulf of Pautzig or Putzig, is formed by a curved tongue of land, at the extremity of which

is

is the little town of Hela. On the coast of Prussia are the two remarkable basons, called the Frisch-Haf and Curisch-Haf, whose waters are fresh, being formed by the rivers of Poland. Each of these basons communicates with the Baltic by a single strait. The Frisch-Haf (Fresh-water Sea) is sixteen or seventeen leagues long, and one to five broad. The tongue of land called the Frisch-Nehrung, which separates it from the Baltic, commences near Dantzick and extends to the east nineteen leagues, with a breadth of from one to three. The part near Dantzic is fertile and well cultivated, but the rest is a barren sand, with only a few fishing hamlets. Under the sands are found calcareous earth, flints, and vegetable decompositions. The communication of this bason with the Baltic has changed several times, and the present passage near Pillau was formed in a great storm in 1500. It is 1,900 to 2,000 fathoms wide, with a depth of thirteen to sixteen feet. General Aspect of the Coasts. Prussia.

The Curisch-Haf owes its name to the Cures, an antient people, who also gave their name to Courland or Curland. This bason is nineteen leagues long, and one to nine broad. It communicates with the Baltic by a channel near Memel, 3,200 feet wide, and eleven to thirteen feet deep. Its depths are very irregular, and it has many banks. From the interior extremity to a place called Windeburg, there is no current, and the waters are so tranquil, that they freeze at the same time as the lakes,

General aspect of the Coasts. Prussia.

but beyond this the currents are very rapid. The tongue which forms this bason is called the Curisch-Nehrung: it is twenty to twenty-one leagues long, but in many places so narrow, that the waves of the Baltic wash over it into the bason. Its antient name, Mendoniemi, or Promontory of Pines, denotes its having been formerly covered with those trees, but a few now only remain, stripped of their branches and resembling posts. Being exposed to all the fury of the winds, the appearance of its surface continually changes, by the formation of sand-hills one year which are levelled the next. It is totally incapable of cultivation, and inhabited only by fishermen and pilots, whose dwellings are in constant danger of being overwhelmed by whirlwinds of sand, as happened to two of them in the seventeenth century. A few deers and hares are the only animals that visit this desart track; but it is frequented by innumerable crows and hawks, the former of which are taken in great numbers for food, and the tithe of them forms a part of the revenue of the pastor.

The whole coast of Prussia is low, covered with stones and lined by sand-banks: it is famous for the amber thrown on its shores in N. and N.W. gales, particularly in the district of Samland, between Pillau and the Curisch-Nehrung, the fishermen of which district are bound to collect it for the crown, and on this account are freed from the military conscription. The sea, however, brings much less of this substance than formerly, and

and the greater part exported from Prussia is procured from the interior, where it is found in the earth. The whole collected in both manners belongs to the king, but adds little to his revenue, the annual value not exceeding £3,500 sterling. The amber brought by the sea is usually enveloped in marine vegetables, which are easily detached; that found in the earth is covered with a hard crust: both contain foreign substances, such as drops of water, grains of sand, insects, &c. The pieces are never very large: the greatest yet found not exceeding a foot in diameter, is in the king's cabinet at Kœnigsberg.(9n) General Aspect of the Coasts. Prussia.

The coast of Courland, like that of Prussia, is low, sandy, and covered with pebbles, but has calcareous cliffs, which seem to run under water to the isle of Gottland. The ports of Liebau and Windau are the only ones it possesses. Between Lyser-ort and Domes-nes is the hill of Domberg, of considerable elevation, which serves to direct seamen. The gulf of Livonia or of Riga is a large indentation, having Domes-nes for its southern limit, between which and Swaver-ort (the south point of the isle of Œsel) is the entrance, eight leagues wide; but from Domes-nes runs off a sand bank four leagues and a reef from Swaver-ort. On the former point are two lights and one on the latter. The coast of Livonia and the islands off it are in general higher than Courland, and are composed of sand, gravel, and calcareous strata. Russia.

Rivers and inland Navigation.

The Baltic receives two hundred and forty rivers, besides a vast number of torrents and rivulets, formed or increased by the melting of the snow and ice. Many of these rivers combining with those of the interior and with lakes, render the countries of the north pre-eminent for inland navigation of vast extent and commercial importance.

Sweden.

The first river of Sweden towards its western limit is the Gotha, which issues from lake Wener, passes Gothenburg at twenty leagues distance from the lake, and empties itself into the Cattegat by two branches surrounding the island of Hysingen. Twenty leagues above Gothenburg are four cataracts, called by the general name of Trollhœtta, or the Residence of the Sorcerers; they occupy a space of 3,000 feet, and the elevation of the uppermost is 120 feet above the level of the Cattégat. Below these falls, the river, with the exception of a few lesser obstacles, rolls smoothly to the sea. It had long been in contemplation to form a navigation from the Cattegat into lake Wener, by the Gotha, but for this purpose it was necessary either to render the whole of the river navigable by overcoming the falls of Trollhœtta, or to avoid them by means of a canal. The first of these projects was preferred, and in 1750 the attempt was commenced and considerably advanced, when an inundation destroyed all the dikes and sluices. It was then determined to have recourse to a canal, but this work

work was not begun till 1794, and its completion cost above £80,000, which was subscribed by an association. The canal commences below the first fall of Trollhoetta, and is prolonged near a league before it again joins the river. Its breadth is twenty-two feet, and its depth six and a half. It has eight locks, a large reservoir, and several cuts to facilitate the passage of boats meeting. All the locks and a part of the canal are cut in a granite rock, and the rest is lined with strong masonry. Inland Navigation. Sweden.

It is also proposed to form a navigation from the Cattegat to the Baltic, through the southern provinces of Sweden, by the Gotha, the lakes Wener and Wetter, the river Motala, &c.; the works for which purpose are commenced. Lake Wener is thirty leagues long and thirteen to fourteen broad. Its elevation is one hundred and forty seven feet above the Cattegat. It has several islands, and receives a number of rivers from the mountains of Norway; the most considerable of which is the Clara-elv, or Great River, at whose mouth is the town of Carlstad, which has above twenty vessels of one hundred and twenty tons, and a great number of boats employed on the lake, conveying the iron ore and wood of Wermeland to the smelting places. Between this lake and the Wetter are several intermediate waters, which facilitate the projected navigation. The Wetter is twenty-four leagues long and six to seven broad; its elevation above the Baltic is two hundred and ninety-two feet. It has few islands, but its currents

Rivers and inland Navigation. — Sweden.

rents are rapid, and it is subject to violent storms; nevertheless as it is deep, in some places the bottom not being found at two hundred fathoms, its navigation is safe for a considerable part of the year. This lake empties itself by the river Motala, which after a course of twenty-five to thirty leagues, falls into the Bay of Browick, at Norkoeping, in the middle of which town it forms three picturesque cascades: its breadth towards its mouth gives it the appearance of a lake. In the intended navigation, a part of the Motala will be followed from Lake Wetter; this river is afterwards to be abandoned, in consequence of its falls and other obstructions, and a canal is to be cut to the gulf of Slœttbacken, at Sœder-kœping. The Gotha and Motala are the only rivers of consequence in the southern provinces of Sweden. Those which descend from the elevations of Halland, Schonen, and Blekingen, have but a short course, and none of them are navigable more than a little distance from their mouths. The rivers of Trosa and Nykœping, in Sœdermanland, are of considerable advantage to the iron works on their banks, but are of no utility to navigation.

Separating the provinces of Sœdermanland and Upland, is the lake Mælar, communicating with the Baltic at Stockholm by two currents, called the North and South. This lake is twenty-four leagues long, and nine to ten broad: its elevation is but six feet above the Baltic. Its waters are of a pure azure, its shores greatly indented, and it has near 1,300 islands, several of which are of con-

considerable extent and very fertile. It is open to navigation from April to November. Besides a great number of rivers, it receives the waters of lake Hielmar, by a wide and rapid torrent, the Hielmar being seventy-three feet higher than the Mælar. The former is sixteen leagues long and six to eight broad, has several islands, but is navigable its whole extent. The inland navigation afforded by these lakes has been extended by canals, the first of which is that of Arboga, uniting the river of that name which falls into lake Mælar with the lake Hielmar: nine locks are necessary to establish this communication. The canal of Stroemsholm, by means of some lesser lakes, a river, and several locks, forms a communication between lake Mælar and lake Barken, on the confines of Dalecarlia. This canal is in great part cut out of the solid granite rock, and some of the locks have a fall of thirty-eight feet.

Rivers and inland Navigation. — Sweden.

The rivers Dhal (or great river of Dalecarlia) Gefle Luisnan, Jungan, Angermanland, Umeo, Skelefteo, Piteo, Luleo, Calix, and Torneo, have all their sources in the mountains of Norway and Lapland, and after courses of sixty to one hundred leagues, fall into the gulf of Bothnia. Most of them combine with lakes, and their breadths are considerable; but they are encumbered by rocks, forming falls of fifty to one hundred feet elevation, which together with the violent freshes, prevent their being of any other utility to commerce than the floating down timber. The northernmost of these rivers experience three inundations annually

Rivers and inland Navigation. Sweden.

nually: the first in March or April, when the ice and snow on the low grounds is melting; the second towards the end of May, when the thaw has reached the middle regions, and when there are heavy rains; and the third towards the end of summer, when the glaciers themselves begin to dissolve. The river of Dalecarlia sometimes rises six or seven feet in twenty-four hours, and twenty-eight to thirty feet in the whole, when the force of its current is so great as to sweep away whole forests and remove vast masses of granite.

Denmark.

The Danish peninsula and the dutchies of Holstein and Mecklenbourg have no considerable elevations, but those they possess are sufficient to give determinate courses to the waters of the interior, some of which empty themselves into the British Sea or the Elbe, and others into the Baltic. The Guden, the chief river of Jutland, rises near the centre of the peninsula, and after a course of forty miles, falls into the gulf of Randers. Its navigation has been recently improved, and it has a good salmon fishery. The other rivers of the peninsula are inconsiderable, but most are navigable, and some have served to establish inland navigations extremely beneficial to commerce, of which the canal of Holstein or of Kiel is the most important.

According to the annals of the north, there anciently existed a natural water communication between the Baltic and the British Sea through the Danish peninsula, by the gulf of Kiel, the little river Lewensau, the lake Flemhud, and the river Eyder

Eyder. It is not known when this route ceased to be practicable, but in 1660, Frederick III. Duke of Holstein-Gottorp, thought of renewing it by a canal. This plan did not, however, take effect, from the different interests of the Duke and the King of Denmark, through both of whose dominions the canal must have passed. In 1773 this obstacle was removed by the union of Holstein to Denmark, and in 1777 a canal was commenced and finished in 1784, at the expence of two millions and a half of rix-dollars, which was defrayed by the government. This navigation has its entrance from the Baltic in the gulf of Kiel, between Kiel and the fortress of Fredericksort, near the mouth of the Lewensau, whose waters are conveyed into it. It joins the north extremity of lake Flemhud, combines with the Upper Eyder, traverses the town of Rensburg,* and continues by the Lower Eyder, which falls into the British Sea below Tœnningen. The canal has throughout a depth of ten to eleven feet: its breadth at top one hundred and six feet, and at bottom fifty-seven. The length of the navigation, from the Baltic to entering the Eyder, is eight leagues, and to Rendsburg ten leagues. The most elevated point is lake Flemhud, whose waters are twenty-nine

Rivers and inland Navigation. Denmark.

*. Renaburg is divided into the old and new town by the Eyder: the former is in Sleswick, and the latter in Holstein. It is well fortified, and has a population, exclusive of the garrison, of 4,000. Its garrison is usually 3,000, but it has accommodations for 15,000. It derives considerable opulence from the canal passing through it; the country round being barren and sandy.

Rivers and inland Navigation. Denmark.

nine feet above the Baltic. For this distance the vessels are drawn by horses, and elevated by three locks, of near ten feet fall each. Three other locks lower them to the lower Eyder; the two first having eight feet and a half fall, and the third from four to six, according to the time of tide. The locks, which are constructed with great solidity, are twenty-six feet and a half deep. A large bridge crosses the lock at Rendsburg, and is the thoroughfare from Copenhagen to Hamburg. From Rendsburg to Tœnningen the vessels use their sails. This navigation is practicable in its whole extent, which is thirty to thirty-six leagues, for vessels of 140 tons; and upwards of 2,000, of various sizes, pass it annually. Its repairs are provided for by a toll of one to three per cent. on all merchandise conveyed by it.

The Trave rises in Holstein and empties itself at Travemunde, three leagues and a half below Lubeck. It has a communication with the Elbe by the canal of Steckenitz, which unites the little river of that name, falling into the Trave, with the Devenau, a rivulet emptying itself into the Elbe at Lauenburg. This navigation is only fit for flat boats, and it requires sixteen days to go from Lubeck to Lauenburg.

Mecklenburg. Pomerania.

The Warnow and Peene flow through Mecklenburg and Pomerania; the first empties itself some leagues below Rostock, and the latter, after combining with several lakes in Mecklenburg, directs its course towards Pomerania, is of considerable size at Auclam, below which it forms a bason called

called Achter-Wasser within the isle of Usedom, communicating with the great bason of the Haf. Rivers and inland Navigation.

From the mountains of Moravia and Silesia the Baltic receives the great rivers, Oder and Vistula, which have almost the entire of their courses through the Prussian dominions. The Oder flows with destructive rapidy through the elevated lands of Silesia, tearing away whole forests and immense rocks from its banks. As the declivity becomes more gentle, and its breadth increases, its current rolls more smoothly through Brandenburg and Pomerania, and it becomes favourable to navigation. After dividing into four principal branches, with many ramifications, towards the frontiers of Pomerania, its waters again unite near Stettin, and fall into the Gros Haf, after a course of 200 leagues. The Oder and the Elbe have communications by the canals of Muhlrose and Finow; the first unites the Oder above Frankfort with the Spree, which, passing through Berlin, joins the Havel, a tributary of the Elbe. This canal is six leagues long, has six feet and a half water, and several locks. The canal of Finow joins the river of this name, which falls into the Oder with the Havel. The canal of Plauen affords a short communication from the Elbe to Berlin, by the union of the Elbe and Havel between Plauen and Magdeburg. These and some lesser canals combine a long navigation through Silesia, Brandenburg, Lower Saxony, and Pomerania. Between the Oder and the Vistula several lesser rivers empty themselves, as the Rega, the Persante, the Wipper, Prussia.

the

the Stolpe, the Lupow, and the Lebe; they are generally navigable, and form ports at their mouths.

The Vistula (Weixel) has its source in Silesia, not far from that of the Oder, and is navigable almost its whole length, which is 220 leagues. After passing through the cities of Cracow, Sandomer, Warsaw, where it is of considerable breadth, Thorn, and Culm, all in Prussian Poland, it directs its course through Pomerania, passing by Graudentz and Marien-werder. Near Mariensburg, it divides into two branches, which are each again subdivided into two others, forming a number of islands called Werder. Three of the branches empty themselves into the Frisch Haf, the largest by the name of Nogat, and the fourth or main branch, which retains the primitive name, traverses Dantzick, and falls into the gulf at Weixelmunde. The only artificial navigation branching from the Vistula is by the canal of Bromberg, which combines the Brahé, a tributary of the Vistula, with the Netze, which falls into the Warthe, and the latter into the Oder. This canal is six leagues long, has six locks, and thirty feet breadth; the boats employed on it carry five to six hundred quintals.

The Frisch Haf, besides the three branches of the Vistula, receives the rivers of Elbing, the Passarge, and the Pregel. The last is deeper than the Frisch Haf, and is navigated by vessels of considerable burden. It has several communications with the ramifications of the Niemen by small canals.

The

The Niemen has its source near Slonim, in the Government of Grodno; runs through Lithuania and Prussia, in which latter it has the name of Memel. Its banks are steep, its course tortuous, and its current slow. Below Tilsitt, towards the Baltic, it separates into two branches, one named the Gilge, running to the S.W, and the other named the Russe, to the N.W.; they both empty themselves by several branches into the Curisch Haf, between Labiau and Memel. The Russe has a good salmon fishery at its mouth. The whole course of the Niemen is about one hundred and twenty leagues. In conjunction with the Dnieper it affords a communication between the Baltic and Black Sea; the canal of Pinsk uniting the Niemen near its head with the Priapetz, which empties itself into the Dnieper. The Dange, which gives a port to Memel, has only a short course, but is wide and deep. Rivers of Lithuania. Prussia.

The Baltic receives a portion of the waters of the great elevated level in the centre of European Russia by the Duna, the Pernau, the Narrowa, &c. The Liebau and Windau, in Courland, are of little consequence; but the Aa, or Bolderaa, which empties itself a little south of the Duna, is navigable to Mittau, the ancient capital of the Dukes of Courland. Russia.

The Duna, or western Dwina, issues from a lake near Torepetz, traverses a part of ancient Russia and Lithuania, and separating Courland from Livonia, after a course of one hundred and eighty leagues, falls into the Gulf of Livonia below Riga.

Rivers and inland Navigation. Russia.

It is navigable from its source to within a few miles of Riga, where ridges of rocks form fourteen falls; these obstacles do not however prevent the floatage of great quantities of timber to the sea. Though its current is rapid it is frozen from the end of November to the beginning of April, and the breaking up of the ice is always attended with an inundation that sometimes does great damage to Riga, the waters rising above the ramparts, while in the summer they are often so low as scarcely to admit the working of boats. Since 1801 the Baltic communicates with the Black Sea by the Duna and Dneiper. The boats employed in this navigation ascend the Duna to the Ulla, which they also ascend to the Lake Beloie, from whence it issues; crossing this lake they arrive at the River Essena, which they ascend to Lake Beresina. Here they enter a canal some leagues long with four locks, wich conveys them into Lake Plawia: this lake communicates by the River Sargutsch with the River Beresina, which falls into the Dnieper.

The Gulfs of Livonia and Finland communicate internally by means of the Pernau and Narrowa and several intermediate waters combined by canals. The Narrowa is the only outlet of Lakes Peipus and Pleskof, which, taken together, are twenty-one leagues long, and two to ten broad, and both have depth for large boats. The navigation of the Narrowa is obstructed half a leagues above Narra by a fall.

The grandest internal navigation of Russia is that from the Baltic to the Caspian Sea, by the canals of Ladoga and Wyschney Wolotschok. This navigation

navigation commences at Petersburg by the Neva, which issues from Lake Ladoga, and after a course of sixteen or seventeen leagues, in a broad but winding channel, and with a rapid stream, empties itself by several branches at Petersburg, above which it is 150 to 200 fathoms broad; but it is shallow, and remains frozen from the end of October to the end of April or beginning of May. Lake Ladoga is the largest piece of fresh water in Europe, being fifty leagues long and thirty broad. Its shores are rocky, it has many islands and shifting banks, and is subject to violent currents and storms. It abounds in fish, and the common seal is also found in it. This lake receives the waters of above sixty rivers, of which the Wolchow, issuing from Lake Ilmen, is the most considerable, being wide and rapid, and having a course of fifty leagues. Rivers and inland Navigation. Russia.

The navigation of the Ladoga being tedious and dangerous, in order to avoid it, Peter the Great ordered a canal to be cut from the Neva to the Wolchow, which was began in 1719, but owing to the defects of the first plan, was not opened until 1732, and in 1766 it was finally improved. The length of this vast work is thirty leagues, following the direction of the lake at unequal distances, but never far from it. It has thirty-six locks, is seventy feet wide, and seven to ten deep. It has three fixed bridges, one at each extremity, and in the middle of each a draw-bridge, besides twelve floating bridges at equal distances. The boats, which are drawn by men, are four days in going from end to

Rivers used in the navigation.

canal; and, in 1791, 16,641 of all sizes passed through it.

In the original navigation, the boats, after clearing the canal of Ladoga, ascended the Wolchow to Lake Ilmen, from this lake entered the River Msta, where they had to encounter five rapids, one of which is six or seven leagues long, and its current so violent that boats descend it in an hour. In 1778, thirty boats having perished here, it was determined to avoid the danger by cutting a canal direct from the Wolchow to the Msta above the rapids. Since the completion of this canal (which passes by Novogorod) in 1781, the old route by Lake Ilmen, is only followed at a certain season, and by boats of a peculiar construction. Ascending the Msta, the boats enter the Lake Mstinskoja, from thence to the River Schlina, and from this latter they are introduced by a little canal with a lock into the River Sna, and by another lock into the canal of Wyschney Wolotschock; this latter is a league in length, and from it a lock lowers the boats into the Twerza, which they descend to the Wolga.

In order to facilitate the ascending navigation from Petersburg, which the rapidity of the Wolchow and Msta renders tedious, a canal has been cut, combing the Tichwin and the Somina, the former of which falls into Lake Ladoga, and the latter into the Molaga, a tributary of the Wolga.

By these canals a navigation has been established, not only between Petersburg and Astracan, but almost to Kiachta, on the frontiers of China, the

navigation

navigation being interrupted only in two places, both not exceeding a distance of sixty miles. By this route the distance from Petersburg to Kiachta is 1,600 to 1,700 leagues, and it requires three years to accomplish it, the rivers being only practicable in the fine season, which is of short duration; the entire route laying between the latitudes of 55° and 61°. The extent of commerce is about one million and a half of rubles annually. The chief articles for the China market are furs; and the returns, teas, silks, &c. The expense of transport amounts to four rubles the pud.[Ba] Rivers and inland Navigation. Russia.

The Baltic and Caspian Seas have also a communication by the canal of Maria. The boats ascend the Neva, cross the lake Ladoga, and enter the river Swir, which they ascend to lake Onega. This lake is fifty leagues long, and twenty-five broad; its shores are rocky and indented, and it has many banks, but is navigable by galliots, managed by four or five men. From this lake the boats ascend the Wytegra, which is joined by the canal of Maria to the Kowska. Ascending this latter they arrive at lake Bieloe, crossing which they enter the river Tcheana, which they descend to the Wolga.

The Baltic receives by far the greater portion of the waters of Finland, by the rivers Wuoxen, Kymene, Kumo, Uleo, Kemi, and innumerable lesser ones. The general features of all these rivers are similar; they flow amidst rocky precipices, forming imposing cascades, and combine with vast masses of internal waters, filled with Finland.

Rivers and inland Navigation. Finland.

rocky islets. These obstacles are, in a great measure, insurmountable, nevertheless some of them have been partially overcome; and, in general, the dangers and difficulties are now better known, and consequently more efficiently provided against, or more easily surmounted. Hitherto, however, the rivers of Finland have been of no other utility to commerce than by the flotage of timber, or the transport of some trifling objects, by the peasants, who are familiarized with the dangers of the navigation. The Wuoxen falls into lake Ladoga, the Kymene into the gulf of Finland, formerly separating Swedish and Russian Finland. The Kumo empties itself into the gulf of Bothnia, near Biœrnborg, and the Uleo and Kemi into the same gulf at the towns of their names.

The Ports, Islands, &c. of the Baltic.

Sweden. Bothnia.

The first town of Sweden is Stroemstad, which has a small port, but little trade; to it succeeds Tanum, Graberstad, Askini, and Lysekill, all of little consequence. Uddevalla is of more note, being a staple town with 4,000 inhabitants; it is situated on a fertile valley at the head of a rocky gulf. The houses are of wood painted: its exports are iron, planks, and herrings.

Marstrand, one of the numerous islands that line this coast, derives considerable consequence from its position and natural strength, which has acquired

acquired it the appellation of the Gibraltar of the north. It is but two miles in circuit, yet has on the north side a safe and commodious harbour for the largest ships, into which are two channels between rocks and islets. Each channel is defended by a battery: the northern one, of ten twenty-four pounders, and thirty-six ten pounders, has quarters for one hundred and fifty men; the southern one for three hundred men. The town, which is a staple, is built on a rocky height on the east part of the island. The houses are chiefly of wood, and very irregular. The population about 1,200. On another elevation, near the centre of the island, is the commanding fortress of Carlsten, one tower of which is employed as a light house. In 1776, Marstrand was declared a free port; in consequence of which, during the American war, it was the entrepot of the trade of the belligerent powers with the Baltic, which rendered it rich and flourishing. In peace the inhabitants find sources of wealth in the herring fishery, and by suppling provisions to the vessels that run in for shelter in bad weather, which exceed three hundred annually. Smuggling is also a profitable branch of the industry of the Marstranders. The Paternosters are dangerous rocks, some miles north of Marstrand. Sweden. Bohus.

In the province of Bohus are the villages of Konghall, consisting of a single street of wooden houses at the bottom of a steep hill; and Kongelfstad, a small town of 850 inhabitants, at the foot of a rock on the north bank of the Gotha.

Nearly opposite it, on a rocky peninsular eminence of Hysingen island, is the castle of Bohus, whose situation renders it almost impregnable; it has quarters for one hundred men.

West Gothland.

On the southern branch of the Gotha, some leagues from the sea, is the city of Gothenburg, the second of Sweden in commerce and population, having 18 to 20,000 inhabitants. The surrounding country is naked and dreary, presenting an uniformity of black rocky eminences, devoid of all vegetation, and which it is impossible to improve. The harbour exhibits a similar confusion of rocky shores, and little craggy islands, of a rugged and forbidding aspect. The city, which is built partly on some of these islands, and partly on a level spot of the mainland, is regular. The houses are chiefly of wood painted to resemble brick, which, with the canals, lined with rows of clipped trees, give it the air of a town in Holland. The port, which has the advantage of being seldom closed by ice, is capable of receiving the largest ships; and a few frigates and a part of the flotilla, are usually stationed here. The city was formerly fortified, but is now open, although it has always a numerous garrison. The approach from sea is defended by the fort of New Elfsborg, on a rocky island in the middle of the channel, and by the citadel of Elfsborg, a mile below the town.

Gothenburg derives a considerable portion of its prosperity from its herring fishery, besides which,

* In Swedish, Gœthe-borg.

which, according to some writers, it possesses one half of the foreign commerce of Sweden; according to others, one-fourth of the imports, and one-seventh or two-thirteenths of the exports. The latter, besides herrings, are iron, planks, rafters, tar, lichens or mosses used in dyeing, together with East India goods; this being the depot of the Swedish East India company. In 1802, the principal imports and exports were as follow:— Sweden. West Gothland.

Imports.		*Exports.*	
Salt	2,250 tons	Bar iron	121,163 schep.
Hemp	1,419	Wrought do.	7,430
Coffee	14,000 lb.	Steel	2,466
Rice	82,547	Mosses	9,298
Tobacco	70,766	Herrings	176,069 tons
Wines	650 pipes	India goods	21,923 rix-dollars
French Brandy	400		

The number of vessels that enter and clear out annually exceed 1,000; and the city has upwards of 200 trading vessels belonging to it. In 1805, the number of mercantile houses was 202. It has considerable manufactures of cordage, canvas, woollens, and tobacco, and builds merchant vessels for sale. Before the entrance of the Gotha is the island of Wingoe, with a very high light-house.

The province of Halland, or Hochland, has no port of any consequence. Kongsbacka, the most westerly, has a village of 250 inhabitants, situated at the head of a deep sound, before which is Nidingen island, half a league long, with a dangerous reef to the south. On the island are two fire- Halland.

Sweden. Halland. fire-towers, kept in activity from the first of August to the first of May. Mael Sound is one of the many inlets within Nidingen island, from which it is distant a league. Monster Sound is some leagues S.E. of the island.

Warberg has 1,000 inhabitants, and is protected by a fortress on a rock, projecting into the sea. Between it and Falkenberg are Cromeleye and Morup bays. Falkenberg, on the river Etter, has 1,000 inhabitants; Halmstad, on the Nissa, 1,200, with a good salmon fishery. Laholm, on the east shore of Batsta bay, and on the little river Laga, has 850 inhabitants.

Schonen. Batsta, on the south shore of the bay of the same name, and Toreko, between Batsta bay and Skelder bay, are villages of little consequence. Off Toreko, at two miles distance, is Hallands Vaderœ island, half a league long, with good anchorage between it and the main, in seven to twelve fathoms. Engelholm, a town of 850 inhabitants, on the river Ronne, which falls into Skelder bay. There are several lesser places on this bay, *viz.* Gryhamn, on the north, Sterbok on the east, and Halshamn on the south, visited only by small coasters. The south point of the bay is the mass of rocks at the entrance of the sound, named Kullen (Koll), which projects towards the sea in imposing forms; and on the highest point, 200 feet above the sea, is a fire-tower.

On the Swedish shore of the sound are Leerhamn, four miles south of Kullen, Hogana, Leerborg, Wigen, and Polskid, villages or hamlets of

of little consequence. Helsinborg, which is also inconsiderable as to size, having but 1,650 inhabitants, is interesting from its situation on the narrowest part of the sound. It is built against a mountain formerly surmounted by a fortress, of which there remains but one tower, from whence is a magnificent view of the sound, a portion of the Cattegat and Baltic, and over almost the whole of the island of Zealand. The sides of the mountains are cut into terraces forming gardens, and from its foot issues a mineral spring analagous to that of the Bristol Hot Wells. In digging the sides of the mountain strata of shells and other substances are found, similar to those at the same elevation on the opposite coast of Zealand. The usual crossing place of the sound is between Helsingborg and Elsineur. Sweden. Schonen.

Landscrona, four leagues south of Helsingborg, has near 4,000 inhabitants: it is a staple town and has a small well sheltered port, with twenty feet water. It is defended by a fort on a little sandy island, and by a citadel on the main. Between Helsingborg and Landscrona is the village of Roa; and between Landscrona and Malmoe, those of Bairebek, Hut, Berby, and Allart.

Malmoe contains 5,000 inhabitants, is well fortified towards the land, and has a considerable trade; though its port is only capable of receiving small craft, and is also subject to be encumbered with sand. Its road for large ships is within a bank, which renders the access difficult. Proceeding south from Malmoe, we meet, in succession, with the

Sweden. Schonen. the villages of Limhamn, Hokœping, Pile, and Hasloss. Skanor and Falsterbo are situated on the peninsular point that forms the entrance of the sound from the Baltic: the former, which is the northernmost, has 150 inhabitants, the latter 250. Close to Falsterbo is a fire-tower to direct ships clear of a large reef that runs off from the point.

Entering the Baltic and prolonging the south coast of Schonen, we pass the villages of Trelleborg, which has a good road, Borla, Smorga, and Haslehamn, and arrive at Ystad, a town of 3,000 inhabitants and some trade: a government packet sails between it and Stralsund. Between Ystad and Sandhammer Point (the S.E. point of Schonen and of Sweden, off which is a large reef) is the village of Kabusa. Rounding the above point, the first place on the east coast of Schonen is Cimbritshamn, with 700 inhabitants and some coasting trade, to which succeeds Friskleger, Esperode, and Mathamn, villages of little consequence.

Christianstad, a staple town of above 2,000 inhabitants, is situated on the Helge, which empties itself into a gulf that separates the provinces of Schonen and Blekingen. Its mouth forms a good port, defended by the fortress of Ahus.

Blekingen. In the province of Blekingen are met in succession, Solvitsborg, or Soelfvesborg, Morrum, on the river of the same name, and Carlshamn, a staple town of 3,000 inhabitants. It has forty trading vessels employed in foreign voyages. Its principal

cipal export is potash, from the birch forests of Schonen and Blekingen, which is esteemed of a superior quality. A number of small trading vessels are built here. Jarnewick, Ronneby, on a river of the same name, and Listerby, are villages between Carlshamn and Carlscrona. Sweden. Blekingen.

Carlscrona is the third city of Sweden, having 12,000 inhabitants. It is built on several rocky islands, joined to the main by bridges, and has a port capable of holding 100 sail of the line. On the island of Trosœ is the principal part of the city, which was formerly of wood, but being burned down in 1790 has been rebuilt of brick; on this island are also the buildings of the Admiralty, Carlscrona being the principal station of the Swedish navy. On the island of Lindholm is a dock for four sail of the line, excavated in the rock eighty feet deep, and which is emptied by a canal into a well, from which the water is pumped by chain-pumps into a reservoir that communicates with the port. Besides this dock, Gustavus III. commenced an immense basin, but which, though it has cost an enormous sum, is still unfinished. The entrance to the port is defended by two strong forts, on islands, whose fires cross. The usual garrison is 1,600 men. It is a staple town and has about forty merchant vessels employed in foreign trade. Torhamn, Christianopel, and Broemesbro, are small places north of Carlscrona.

Calmar, the principal town of Smoland or Smaland, near the middle of the straits of Calmar, has 4,000 in- Smoland.

Sweden. Smaland. 4,000 inhabitants, and is well built, the streets being at right angles. Though not a staple, it has a considerable trade, and seventy vessels from 100 to 300 tons belong to it. It gives its name to the treaty by which the three crowns of the north were united in Margaret of Waldemar, in 1397. Half a mile from the town is the castle in which the treaty was signed, and which is now a gun-powder manufactory. North of Calmar and on the sound are Skjalby, Risby, and Burswik; farther north Saltwik, Riskebo, Westerwik, a town of more than 2,500 inhabitants, with a manufactory of arms and some ship building: Silbuy, Urowenburg, Blechel, Hamelwik, and Witwik, on the same province, are villages visited only by coasters.

East Gothland. In East Gothland are the two considerable gulfs of Slætbacken and Braviken or Browick; on the south shore of the first is Sœderkœping, a town of 560 inhabitants, and on the river Motala, which empties itself into the Gulf of Browick, is Norrkœping, a staple town of 10,000 inhabitants. Its port can only receive vessels of light draft, of which from 300 to 400 enter it annually. Its chief exports are thirty to 40,000 scheppunds of iron, iron cannon, and copper; thirty to forty trading vessels belong to it, and it has manufactures of paper, arms, woollens, sugar refineries, &c. The Motala also affords a lucrative salmon fishery.

Sœdermanland. In the province of Sœdermanland are Nykœping, a town of 2,300 inhabitants; Ottenbak, Outerwik, Trosa, on the river of the same name, with

with 500 inhabitants; Sœder Telje, at the head of a sound which communicates with Lake Mælar by a canal. North of the entrance of this sound is Landsort Island, where ships take pilots for Stockholm, and on which is a light. Sweden. Södermanland and Upland.

STOCKHOLM is partly in the Province of Sœdermanland and partly in Upland, occupying seven or eight islands and peninsulas at the entrance of Lake Mælar. The channel for ships serpentines through an archipelago of islands and rocks twelve leagues in extent, and terminates in a beautiful basin capable of holding 1,000 ships, and lined by a quay, a mile in length, along-side which the largest vessels can lay afloat. The approach to the city is singularly picturesque; granite rocks, rising boldly from the water, some totally naked, others feathered with wood and surmounted by villas. The largest island, on which is the principal part of the city, forms two channels, through which the waters of the lake rush out with great impetuosity; over each is a wooden bridge. In winter all the channels are frozen. The palace, a magnificent edifice, crowns the most elevated point of the city; the streets leading to it, as to a centre, rise amphitheatrically, and are straight and wide. The population is from 80 to 90,000. Its commerce employs 5 to 600 vessels, in and out; of which, 250 employed in foreign voyages, and a great number of coasters belong to it. In 1802, when 567 vessels entered and 598 cleared out, the principal exports and imports were, (exclusive of colonial

Sweden. Södermanland and Upland.

colonial produce, it being the depot of the West-India Company):

Exports.		*Imports.*	
Bar iron	253,419 schep.	Corn	200,000 tons
Wrought do.	22,246	Wine and brandy	7,340 pipes
Anchors	1,220	Sugar	[illegible] lbs.
Cannon	1,443	Coffee	747,954
Iron plates	4,820	Spices	100,000
Steel	7,061	Colours	250,000
Copper	3,384	Salt	[illegible]
Brass	1,482	Lemons and Oranges	300,000 pieces.
Alum	1,696		
Tar	83,899 tons		
Vermilion	2,782		
Cabinet ware	3,909 Rix D.		

Stockholm has three merchants' building yards, a royal navigation academy, and a depot of charts.

Upland. The only port towns of any consideration in the Province of Upland, are Norr Telje, with 800 inhabitants, Ornwik, Waddo, Grislehamn, opposite the isles of Aland, where travellers embark, or take sledge, for Abo, in Finland. It consists only of the post-house, of brick, and some peasants' huts; it has a small port, formed by a tongue of land on the N.W. and S.E., and sheltered by an island on the north. In the same province, and in the channel of Aland, are Œsthammar, with 800 inhabitants; and Œregrund, on an island, with 600. This latter exports the iron from the foundries of Danemora, chiefly to England, where it is converted into the best steel.

Gestrikeland. The chief place of Gestrikeland is Gefle, a staple

Sweden. Gestrikland.

staple town of 9 to 10,000 inhabitants. It is situated on both banks of a river of the same name, ten miles from the Gulf of Bothnia, and is accessible to moderate sized vessels, but those of burden are obliged to lighten in a bay half a league from the river's mouth. It has sixty to seventy vessels belonging to it employed in foreign voyages, besides a number of coasters. Its chief exports are iron, 30 to 40,000 schep., planks, tar, and potash. Its imports 50,000 tons of corn and 10,000 of salt.

Helsingland.

The province of Helsingland has the port-town of Sœderhamn, with 2,000 inhabitants, and Hudwikswall, with 1,400.

Medelpad.

Medelpad has only Sundswall of any consideration, with 1,500 inhabitants, a manufacture of linen, and a building yard for small craft.

Angermanland.

In Angermanland, and at the mouth of the river of the province, is Hernœsand, with 2,500 inhabitants and an annual fair.

West Bothnia.

In the province of West Bothnia are the towns of Umeo, the principal of the province; Piteo and Luleo, situated on the rivers of the same names,* and having each a population of 7 to 900 inhabitants. Torneo, though ceded to Russia with Finland, in 1809, is in this province. It contains between 6 and 700 inhabitants, and is situated on a peninsula, named Swensar, of which the Torneo at times makes an island. Several of the houses are two stories, and are of wood, painted and thatched.

* The termination in *o*, or in *a*, pronounced as *o*, signifies river.

Sweden. West Bothnia.

thatched. The merchants resident here have laid out gardens, planted trees, formed walks, and thus have endeavoured to compensate the defects of nature. It had formerly a good harbour, but the accumulation of sand towards the head of the gulf has almost spoiled it. The exports are butter, tallow, salted provisions, salted and smoked rein-deer flesh, salmon, pilchards, timber, and furs, procured from the Laplanders, who visit this town once a year with the produce of their chase, consisting chiefly of the skins of rein-deer, foxes, wolves, and ermines. Upwards of 4,000 birds (woodcocks, woodhens, and grouse) are also sent to Stockholm annually.

Torneo derives a certain celebrity from the visits of several astronomers to measure a degree of the meridian; first, by Belberg and Spole, Swedes, in 1695; by Maupertius and others, in 1736; and by the Swedes, Swamberg and Overbom, in 1800 and 1801. Maupertius, who was here in winter, describes it as a most frightful residence: "The low houses being entirely sunk in the snow, which always falling or ready to fall, concealed the sun even at noon. In the month of January the cold was so intense that spirits of wine froze, and the wood of the houses split with great noise: the streets were totally deserted, for those who dared venture abroad were almost sure to be frost bitten; while the winds seemed to come from every direction, and with such violence as to blow down the chimnies." This severity of climate could not, however, prevent the eccentric astronomer

astronomer from falling in love with a nymph of Torneo, and in this region of ice he composed a warm love song in praise of his hyperborean mistress. A recent traveller,* who visited Torneo in summer, gives a more pleasing account of it. According to him, the long winter is compensated by the almost continual presence of the sun in summer; and the January's cold of 76° below ice, by the July's heat of 88°. The church of Lower Torneo, on the island of Biorkion, a mile from the town, is the spot from which travellers usually make it a point to see the sun at midnight at the summer solstice. *Sweden.* *West Bothnia.*

The vast number of islands that line various portions of the coast of Sweden, rendering their navigation perillous, at the same time that the havens they form afford shelter to the sea-beat vessel, are in general barren uninhabited rocks, or at the utmost, the temporary residence of some fishermen. Three of them are, however, worthy of a detailed notice, either from their extent and productions, or from the recollections they call forth. *Swedish Islands.*

HUEN, or HWEN, in the Sound, is four miles from Landscrona, and three from the nearest point of Sweden; seven from Elsineur, and four from the nearest point of Zealand. It is about six miles in circumference, and contains 5 to 600 inhabitants, of whom 250 are collected in a little village on the *Huen.*

* Acerbi.

Swedish Islands.

Huen.

north side. The soil, though sandy, produces rye and pasturage for some horses, cows and sheep, and a considerable number of hogs are also reared. The taxes paid by the islanders amount to about £150 a year. This island antiently belonged to Denmark, and towards the middle of the sixteenth century was granted by Frederick II. to Tycho Brahe, who erected a mansion and observatory, to which he gave the name of Uraniburg, or the Castle of the Heavens; here he established the position of the fixed stars, perfected the theory of the moon, calculated the course of comets, and gave a new basis to astronomy. The traveller now seeks in vain for the buildings erected by Tycho, no other vestige of them remaining than an elevation formed of their rubbish. The island was ceded to Sweden with the province of Schonen, by the treaty of Roskild, in 1658.

Œland.

Œland is separated from the coast of East-Gothland by the Strait of Calmar, from two to three leagues broad. The east coast of the island is bold and clean, but the west is lined with dangers. An elevated ridge, called Alwar, runs through its whole length, which is twenty-five leagues, and its breadth only one and a half to two. The base of the island is a calcareous reddish stone with green and grey veins, besides which it possesses aluminous schistus, free stone, blocks of granite, porphyry, rock christal, and a great quantity of petrified shells, and coralaginous substances. All the elevated ground is stony and barren, producing only a scanty pasture for sheep. The rivulets which

which descend from these elevations fertilize their declivities, as well as the border of level ground towards the sea, where are produced, the oak, beech, hazle, and walnut, besides pasture for a considerable number of horses, horned cattle and sheep. The horses are very small but active and hardy. The island has some wild deer and boars. The population in 1800, was 22,605 souls, whose chief industry, besides the raising cattle, is cutting building-stone, burning lime, and drawing the aluminous schistus from the mines, all of which are sent to the continent. Swedish Islands. Oland.

There is no town on the island, but the following places are worthy of notice. Borgholm, an antient and royal castle on the west, it is a square with round towers at the angles, and surrounded by high walls, without which is a village: near it is the port of Borgehamn. Ottenby, a royal farm with extensive buildings, occupies the south extremity of the island, and is separated from the other lands by a wall ten feet high, which crosses this extremity from side to side. Mœkleby, a parish in which is the principal alum mine twenty-five feet deep. Bœdehamn, on the west, is the port of communication with the island of Gottland, and on the same coast are the ports of Kœllehamn, and Sikehamn. Laiglet and Henderum are mineral springs, used by the islanders and people from the neighbouring coast.

Œland has frequently been an apanage of the princes of Sweden, with the title of county, and as such was last possessed by Charles X, before he

Swedish Islands. Œland.

ascended the throne: the castle of Borgholm was his habitual residence.

The southern channel into the Strait of Calmar, is between the island of Œland and a group of rocks, called the Utclippers or out-lookers; between these latter and the main there is no ship channel, the space being filled with rocks. Nearly in the middle of the Strait of Calmar, towards its northern extremity, is an insular rock almost perpendicular, 230 feet high, and surrounded by reefs. In its crevices grow some oaks, beeches, and birch, and its only inhabitants are wild goats and sea-birds. Its proper name in Swedish is Blokulla, or the Blue Mountain, but as it is celebrated in the popular tales of the country as the resort of sorcerers, the superstitious seamen, believing this a name of ill omen, call it the Virgin's mountain.

Gottland.

GOTTLAND* is eighteen leagues distant from the nearest point of Sweden, and from Windau the nearest point of Courland: it is twenty leagues long and seven at its greatest breadth, forming an elevated plain from 150 to 200 feet above the level of the sea. In some places the shore ascends gradually, but in others it resembles a wall. It has two hills, Torsberg on the east, and Hoberg on the south. The first is a steep and naked rock, on the summit of which is a hollow plain, 1,200 feet in circumference, and always covered with water.

* Those who believe that this island was the cradle of the Goths that marched against the Romans, write Gothland, but the great majority of the Swedes write Gottland, (good country).

water. The Hoberg is also a steep rock, remarkable for its caverns, one of which, called the bed-chamber of the old man of the mountain, resembles a well-proportioned apartment, and is the subject of many popular tales.

The base of the island is composed of calcareous substances, such as marble, breaches, calcareous spath, and earth, distributed in strata, and often mixed with free stone containing mica. Besides the extensive beds of madrepores, &c. found round the island, entroques, anomias, and mytilus, are also met with petrified, as well as fragments of carneolas, agates, and granite. The soil towards the north is a compact clay producing forests of pines; on the south it is a mixture of sand, clay, and earth. The interior of the island has several lakes and rivers; of the latter the principal is the Lummeland, which issues from lake Morteba, sinks into the earth, and after having made itself a subterraneous passage twelve feet wide and six high, reappears as a rapid torrent.

The climate of this island is more temperate than that of the neighbouring coast of Sweden, the walnut-tree producing fruit. The cultivated grains are, wheat, barley, rye, and oats. Cattle are reared in considerable numbers, particularly sheep, of which the breed has been improved by a cross of the merino. The forests in the north part of the island furnish plank, tar, and potash for exportation, and the quarries, marble, building, and lime stone.

Swedish Islands. Gottland.

The population of the island, in 1802, was 32,000, chiefly spread over the country in isolated farms, for there is but one town and two or three villages. Wisby, the former, is built on a rock on the west coast, and contains 3 to 4,000 inhabitants. It was formerly a depot of the Hanse league, and the ruins of several large churches and other buildings, prove it to have been of much more consequence than at present. Its port can only receive a few small vessels. The havens of Capelshamn on the north and Slitehamn on the east, are more capacious; particularly the latter, which is one of the best ports of the Baltic, and is defended by the fort of Carlsbelt.

A considerable number of runic stones have been found on this island, but none more antient than the introduction of Christianity. Until the thirteenth century, the Gottlanders enjoyed a certain independance under the protection of Sweden, but their internal disputes at last caused their entire subjection to that power. In the middle of the fourteenth century, the island for a short time fell under the dominion of Denmark, and towards the end of the same century, a horde of pirates occupied its coasts, from whence they committed depredations over all the Baltic. The Teutonic Knights at last attacked and destroyed this band, and the island acknowledged the sovereignty of the Grand Master of the Order, who sold it to Sweden for 9,000 gold nobles. When Gustavus Vasa put an end to the union

of

of Calmar, he sought to get possession of this island, as a part of the antient domain of Sweden, but the attempt failed, and it remained to Denmark until 1644, when it was ceded to Sweden by the peace of Brœmesbro.

Swedish Islands. Gottland.

Gustavus IV., who got himself created a knight of Malta by the emperor Paul, conceived the project of transporting this order to the Baltic; and granting it Gottland as a fief, on the condition of keeping in commission a number of frigates to convoy and protect the Swedish trade in the Mediterranean from the Barbary corsairs. Negotiations were commenced with the chiefs of the order residing in Sicily and Petersbourg; but the war which took place between Sweden and Russia, and the death of the emperor Paul, put an end to this project.

Gottland forms a government, and has a bishop. It has a small militia for its defence, and furnishes a considerable number of seamen to the fleet.

In the neighbourhood of Gottland are some little islands not unworthy of notice, *viz.* Farœ, separated from the north end of Gottland by Farœ sound, has a good port; and close to its north side is the lesser island Norholm. The great and little Carlsœ are two masses of rocks resembling ruined walls, and without trees, one mile and a half off the S.W. coast of Gottland; the greater is considerably elevated, and has a large cavern, called the Robber's Cave. There is good anchorage all round the little Carlsœ, in eight to ten fathoms;

Swedish Islands. Gottland.

fatoms; but the great one is foul, and ought not to be approached under eleven fathoms. Reef Holm is north by east of these rocks. Gottska Sandoe, some leagues from the north end of Gottland, is surrounded by banks, and is the rendezvous of seals.

The other islands, in the usual route of navigation, are that called the Rock, nearly east from Carlshamn, and Hanoe, near the entrance of the gulf of Carlshamn. In the archipelago of Stockholm, the islands worthy of notice are Utoe, which has productive iron mines, Wœrmdoe, covered with the country houses of the merchants of Stockholm, and Lydingoe, which communicates with the Royal Park by a bridge, and is fertile and well cultivated.

Denmark.

The Danish islands, at the entrance of the Baltic, are, in general, diversified with hills rising in peaks to the height of 100 or 200 feet, mostly cloathed with grass, and interspersed with clumps of trees; the vallies and plains are well watered by rivulets that descend from these elevations. The chief substances found in digging are coral and shells, decomposed and mixed with sand, clay, and flints, and generally covered with a fertile mould; masses of granite are also sometimes met with at considerable depths. The climate of the island is moist, but mild, relative to the latitude, and so favourable to vegetation, that agriculture

and

and the rearing of cattle afford the inhabitants not only abundant subsistence, but also considerable objects of commerce. Denmark.

These islands have been the seat of the Danish monarchy from the earliest times. They form three governments or grand bailages: the first comprehending Zealand, Mœen, and several lesser islands, and Bornholm in the Baltic. The second includes those of Funen, Langeland, Aerce, and a great number of small ones. Laland, Falster, &c. compose the third. Lessoe, and Anholt, in the Cattegat, and some others near the coast of Jutland, are in the jurisdiction of that province, and Alsen and Femern in that of Sleswick.

Zealand (Siæland), the principal of the Danish islands, is twenty-four leagues long, and twenty to fourteen broad, containing 2,112 square miles, and a population of 250,000 souls. On the north, the waters of the Cattegat penetrate far into the land, and form the gulf of Isefiord, divided into two branches, and which has but nine feet water at the entrance, and five to seven fathoms within. The entrance is defended by Skanze fort on the west point. On the S.E. is the gulf of Kioge. On several parts of the coasts are spaces of rocky cliffs, called Klints, of which the most remarkable forms the S.E. extremity of the island, called Steven's Klint; its elevation is 120 to 180 feet. It is composed of lime-stone, chalk, and pyrites, in alternate strata, and contains a multitude of petrified remains of animals and plants. On the west Zealand.

is

Denmark. Zealand island.

is the rock of Grumperup, and on the south that of Faxœ, presenting nearly similar appearances. Gillelyhead is the north point of the island, a league east of which is Nacca head, forming the entrance of the sound, with two light-houses. Ressnaes, the N.W. point of the island, is the extremity of a long peninsula, and Zealand head is the north point, off which is an islet and reef.

Zealand is well watered by lakes and rivers, abounding in fish. The most considerable river is the Nesaa, which nearly traverses the island, and empties itself into the Baltic. Barley is the principal grain cultivated, and considerable quantities of it are exported to Norway. The extensive pastures of the island feed large flocks and herds; and the Zealand horses are esteemed for their strength and figure.

On the west branch of Isefiord are Nykœbing and Holbek; and on the east branch Fredericks-wœrk, with a foundery of cannon, and a manufacture of small arms and gunpowder. At the head of the same branch is Roskild, the ancient capital of Denmark, and still the burying place of its kings. It is now reduced to about 1,500 inhabitants; and the only remains of its ancient grandeur, besides the tombs of princes and illustrious men, is a vast and handsome church.

Elseneur (Helsingor), on the narrowest part of the Sound, is a considerable town, containing 7,000 inhabitants, and well fortified both towards the land and sea. It has only a road, though a haven for moderate sized vessels might be formed at

at small expence. The consuls of the trading nations reside here; and at its custom-house the duties of the sound are paid. Its chief prosperity is derived from supplying ships with fresh provisions. Passage-boats are always ready to cross the Sound from Elseneur to Helsingborg. Denmark. Zealand island.

Cronborg, or Cronenborg castle (the castle of the crown), is a royal residence half a mile north of Elseneur. It is a regular square, with a Gothic tower at each angle, surrounded by a ditch and flanked with bastions. It mounts a great many guns, but, from its height and position, is entirely exposed to the canonade of shipping, which might level it to the ground in spite of its bastions. It is built entirely of free stone, in the Gothic stile. Besides the royal apartments, which are insignificant, it contains the residence of the commandant, a church, a corn magazine, and other necessary buildings of a small fortress. One of its towers serves as a light-house. All vessels passing the castle are obliged to salute it, either by lowering their sails, or with their guns. Here queen Matilda was confined until removed to Stade. Half a mile from the castle, on an eminence, commanding a fine view of the Sound, is the new palace of Marienlyst, near which is a garden, in which the murder of Hamlet's father is supposed to have been committed, and which is thence called Hamlet's garden.

Copenhagen *(Kœbing-haven)*, or Merchant's port, from its antiently affording refuge to merchant vessels, when pursued by pirates, became

the

Denmark. Zealand island.

the royal residence in the fourteenth century. It contains 100,000 inhabitants, is partly built on the main island, and partly on the island of Amager or Amek, separated from it by a narrow channel, crossed by two bridges. The city is regularly and very handsomely built: the houses of brick and wood, and the public buildings of free stone. The port between Amak and the main is one of the best of the Baltic; the outline being formed by nature, but greatly improved by art. The entrance admits but one ship at a time; but within it forms several basins capable of holding 500 sail. It has two royal dock-yards on islands, where every ship has her particular magazine. The dry dock is constructed of wood, and requires twenty hours to pump it out with horses.

Copenhagen is fortified with a rampart and considerable outworks, some of which advance into the road; and when supported by vessels of war present a formidable line of defence towards the sea. The usual garrison is six regiments of infantry, the horse and foot guards, a squadron of hussars, a corps of artillery, and two battalions of light infantry; in all, 10,000 men, besides the seamen and persons employed in the dock-yards, who are bound to take arms when required.

Copenhagen is a free port, and was long the only one of Denmark into which it was permitted to import the produce of Iceland, Greenland, India, China, and America; and though several other ports have latterly received the same privileges, the principal returns still continue to be made

made to the capital. The number of vessels that enter and clear out annually is between 11 and 12,000. In 1805 they were as follows:— Denmark. Zealand island.

Entered.		*Cleared out.*	
From India and China..	25	To national ports	3,975
America	68	Foreign ports	1,720
Foreign European ports	1,572		6,695
Ports of Denmark	2,774		
Holstein.....	748		
Norway	416		
	5,603		

The number of merchant vessels belonging to Copenhagen, in the same year, exceeded 200.

Kioge is on the gulf of the same name, at the mouth of a river. Corsœr on the west, the usual crossing place of the great belt to Nyborg in Funen, has only a road, but a number of small vessels belong to it. Callundborg on the N.W. with the ruins of an ancient castle, in which Christian II. ended his days a prisoner, has a good port: these towns have 1,500 inhabitants each.

Mæen Island is separated from the S.E. end of Zealand by Ulfsund, a narrow strait. It is about five leagues long, and from one to three broad, containing forty square miles. On the eastern-most point is a mass of picturesque cliffs, called Mæen's Klint, more than 200 feet high, and principally of chalk, mixed with great quantities of fossil shells. Some parts are entirely bare, while others

Denmark. Mean. others are covered with trees and herbage; and in some places the cliffs project over the sea like arches. The highest point is named Konigsberg, and Kongs-stoll, King's Mount, or King's Stool, from its supposed resemblance to a throne: on it is a light-house. Several strong springs spout from those cliffs, one of which is mineral, but said to produce vertigos. The island exports 15,000 tons of corn. Its population is 9,000. Stege, the only town of the island on the west side, is almost surrounded by water, and has a strong castle, and a vast and handsome church. The island has besides fifty villages and hamlets.

Samsoe. Samsœ, about midway between Zealand and Jutland, is nearly five leagues long, and is composed of two peninsulas; the largest five miles broad. It is fertile, and has 6,000 inhabitants and several villages. The other islands belonging to the government of Zealand are of inferior consequence; their names are, Kyholm, Lindholm, Veyerœ, and Veyerœ-bosseuse, between Zealand and Samsœ. Syerœ, off the N.W. end of Zealand, between Resnaes and Zealand's head, is seven miles long, and one to two broad. Hasselœ, in the Cattegat, one mile and a half long. Reersœ, Musholm, and Drosselberg, in the Great Belt, near the coast of Zealand. Eegholm, Agersœ, and Cinœ, off the S.W. point of the same island. Glænœ, Lenœ, Dypsœ, off the south end. Farœ, Toarœ, Baggœ, between the south extremity of Zealand and the isle of Falster. Saltholm in the Sound, is four miles long, and two broad; it is almost

almost entirely covered by the sea in autumn and winter, but in summer affords good pasturage to the cattle of the isle of Amak. It also supplies Copenhagen with marble, free stone, and lime.

Amak.

FUNEN (Fyen) is the second of the Danish islands in extent, being sixteen leagues long and eleven broad, containing 1,376 square miles and 100,000 inhabitants. On the N.E. is the gulf of Odenzee, the only considerable indentation. It has some hills, several lakes and rivers abounding in fish, and forests of oak and beech. It affords rye, barley, oats, peas, and maize for exportation; and has, besides, extensive orchards and hop grounds. Fattening cattle for export, and raising bees, form considerable branches of its rural economy.

Funen Island.

The chief places are Odenzee, at the head of the gulf of the same name, with 6,000 inhabitants. It has some manufactures of woollens, and prepares skins for gloves, the water of the rivulet which runs through it being particularly proper for this purpose. From twenty to thirty trading vessels belong to it, and two hundred enter and clear out annually. Nyborg is a fortified town, of 1,600 inhabitants, on the Great Belt, where a duty is paid by all merchant ships passing through. It is also the usual crossing place to Corsoer, in Zealand, and has a good port, and forty to fifty single-masted vessels belonging to it. Svendborg on the south end of the island, and Faaborg on the S.W., have each two or three thousand inhabitants. Middelfart, on the narrowest part of the

Denmark. Funen Island.

Little Belt, is the usual crossing place to Snoghoe, in Jutland; it is a small town, chiefly inhabited by fishermen and boatmen. Bogenzee on the north, and Lessens on the west, are of little consequence.

Langland.

LANGLAND, or Long Island, between Funen and Laaland, is ten leagues long and only one broad, containing seventy square miles and 12,000 inhabitants. It produces some corn, and exports salted meat, hides, honey, and wax. Rudkoebing, the only town, is on the west, contains 700 inhabitants, and from it all the trade of the island is carried on.

Æroe.

ÆROE, south of Funen, is four leagues long, and from one to three miles broad: its shores are indented by numerous creeks and coves. It is almost entirely under cultivation, producing corn, a great quantity of cummin, and aniseed. Its population is 5,000. The chief place, named Æroeskoebing, is on the north, and defended by a fort.

Small Islands.

The small islands in this government are Taasinge, between Funen and Langland; in the Great Belt, Ramsoe; Sprogoe, nearly in the middle of the Belt, between Nyborg and Corsoer, has a few peasants' huts and an inn, with beds and provisions for the passengers that may be detained here by the weather; Wresen, between the north end of Langland and Funen; Thoroe, between Funen and Taasinge; Dryoe, Avernoe, Koe, and Lyoe, between Funen and Æroe. In the Little Belt, Brandsoe and Auroe.

LAALAND,

Laaland, the third of the Danish islands in size, is eleven leagues long, and six to three broad, containing 240 square miles and 40,000 inhabitants. It is generally low, so that considerable portions of its coasts are inundated during the irregular elevations of the sea; it is, however, so fertile, that it is said to produce as much wheat, rye, barley, oats, peas, beans, lentilles, hops, and flax, as all the other islands together. It has besides considerable forests of oaks, whose acorns feed vast herds of swine, and it also produces a great quantity of pearl barley. It is much frequented by aquatic birds, whose feathers afford a profitable export. It has five towns, viz. Naskow, the chief place, on the west, 1,500 inhabitants; Saxekoebing on the north; Nysted on the S.E.; Rodby on the south; and Mariaboe on a lake in the centre of the island. Denmark. Laaland Island.

Falster is separated from the east end of Laaland by Guldborg sound, and from Moen by Grensund. It is eight leagues long, and from one to four broad, containing 150 square miles and 15,000 inhabitants. The south point, called Gieddesby head, is high and remarkable. It is well-watered and fertile, exporting 40,000 tons of corn, and from the great quantity of fruit it produces is called the Orchard of Denmark. It has a mineral spring celebrated for its cures. The towns are Stubbekoebing on the north, and Nykoebing on the west: the latter is considered the chief place, and has a royal castle; it has besides thirteen villages. The Trindel reef, with but Falster.

Denmark. Falster. eight feet water, runs out to the S. E. from the east part of the island.

Small Islands. The small islands in this government are, Værce, Ragœ, Fayœ, Lilla, Aksœ, and Massenedœ, all between Zealand and Laaland.

Lessœ. In the government of Jutland are the islands LESSŒ and ANHOLT in the Cattegat, and some lesser ones. Lessœ is about four leagues long, and one and a half broad. Though chiefly covered with a barren sea sand, it has some cultivated spots and two or three hamlets. It is surrounded by reefs and shoals above and under water.

Anholt. *Anholt* island, eight miles from Jutland and seven from Smaland, is surrounded by dangerous banks.

The other islands in this government are Hielm off the bay of Ebletoft, Thunœ near the N.W. end of Samsœ, and Endelave between Samsœ and Jutland.

Alsen. *Alsen*, separated from the coast of Sleswick by a narrow strait, is ten leagues long and one to three broad, containing fifty-six square miles and 16,000 inhabitants. On the west is a deep gulf. It is celebrated for the mildness of its climate and great fertility, producing abundance of corn and fruit, of which latter it exports ten to twelve cargoes annually. It is also agreably wooded, and has game and fish in plenty. The chief place is Sonderborg on the west, with a good port and considerable trade to Norway, England, and France: near it is the antient castle of Sonderborg, in which Christian II. passed seventeen years of captivity. It now belongs

to

to the ducal house of Holstein-Augustenburg-Sonderborg, whose chief possessions are on this island, and principal residence the castle of Augustenborg, at the head of the gulf on the west. Nordborg is a large village on the north, and the second place of the island. Denmark. Alsen.

Femern Island is separated from Holstein by a narrow strait: it is about five leagues long and two broad, containing fifty square miles. It is so low that the sea is only kept from covering the greater part of it by dikes, and many of its lakes are below the level of the latter. The total want of eminence or wood to break the force of the winds, renders the winter season so boisterous, that the communication with the main is both difficult and dangerous, and the vessels belonging to the island are obliged to winter in the port of Heiligenhafen in Holstein. Femern Island.

This island was entirely depopulated in the war between Eric, King of Denmark, and the princes of Holstein, in the thirteenth century. It was repeopled from Holstein, and has at present 9 or 10,000 inhabitants, who raise wheat, rye, and barley, and rear great numbers of cattle. Burg, the chief place, has 1,500 inhabitants; it is towards the south end of the island, and had formerly a port, but which is now filled up. The villages are numerous and all built after one fashion, forming a square, in the middle of which is a vacant space of considerable size, and in the center of this space a spot called Dingstein, or the seat of judgment, surrounded by stones and

Denmark. Femern Island.

shaded by a tree. Here justice was formerly administered, and here the villagers now assemble on holydays.

Near the N.W. part of the island is an elevation called the Virgin's Mount, where the sanguinary tyrant Eric caused all the young women of the island to be assembled and massacred. In the parish church is shewn an image of the Virgin Mary, which according to the popular belief, was covered with a sweat of blood during the execution of these victims.

The Femerners, though their language is harsh* and their appearance rude, are extremely hospitable. Among other peculiar customs, they have one called the ceremony of the window, which consists in nocturnal visits from the young men to the young women, the entry being made by the window; these visits, which are regulated by traditional rules, are facilitated by the mothers, and usually end in marriage. It is said, there are fewer illegitimate births in this island than in the neighbouring countries where this custom does not prevail.†

Bornholm.

Bornholm Island is about seven leagues and a half distant from the coast of Sweden, and upwards of seventeen from the island of Rugen. It is eight leagues long, five and a half broad, and in 1811 contained 19,000 souls. It is considerably

* They speak a low German mixed with Danish.

† Vestiges of a similar custom are still found in Wales; and the bundling among the outsettlers of North America, is of the same nature.

ably elevated, and the shores are composed of steep rocks, surrounded by reefs very dangerous to navigation, for though generally marked by fire-beacons, scarce a year passes without several shipwrecks. The base of the island is a calcareous rock, but mixed with free-stone, schistus, granite, and other stones that denote different origins. This island forms the medium between the primitive mountains of Scandinavia and the calcareous and sandy heights of Denmark and Germany. The Bornholm free-stone is used in the public buildings of Copenhagen, and its deep blue marble is much esteemed. It has also different species of clay proper for the manufacture of pottery and porcelain, ochres, bolar earth, and coal. The clays are exported to Copenhagen for the great porcelain manufactory, but the coal has hitherto been neglected, some pretending that the disposition of the veins render them too difficult to be profitably worked, and according to others the mineral itself is of a bad quality, from containing too much sulphur. The veins of this substance extend three or four leagues from the island towards the coast of Sweden. On the shores of the island pebbles are met with which, under an argillaceous crust, contain particles of spath and christal. In some marshy spots, at the depth of ten and twelve feet, trees are found so well preserved as to be used in joiner's work; they all lay with their heads to the west, and those to which the sea water has had access, are impregnated with sulphur and vitriol. Denmark. Bornholm.

Denmark. Bornholm.

The climate of Bornholm is drier than that of the other Danish islands, and from the proportion of deaths to the population, must be healthy. A vast heath occupies the centre of the island, on which also grow some juniper and other bushes, which are carefully collected for fuel, the island having very little wood. This heath also affords pasturage for sheep. The horned cattle are inferior to those of the other islands, but the horses are esteemed for their strength and fleetness. The spring brings to the island large flocks of rooks (cornix frugilega) of which the peasants take vast numbers and consider them delicate food. The vegetable productions are wheat, rye, barley, cummin, hemp, and flax. More then forty rivers and rivulets, abounding in fish, water the island, and most of them find their way to the sea.

The chief industrial pursuit of the Bornholmers, after agriculture and the rearing cattle, is the fishery, which affords about one hundred ton of cod for annual export. The fabrication of corn, brandy, beer, coarse pottery, tiles and bricks, wooden kitchen utensils, and chimney clocks, as well as the quarrying marble and free stone, also employ a part of the population. The principal imports of the island are coffee 17,000 lbs. sugar 18,000 lbs. and tobacco 25,000 lbs. The centre of commerce is at Ronne, near the middle of the west side of the island, which is also the residence of the governor, and has 2,000 inhabitants. Its port is defended by a castle, and in 1800 it had sixty

sixty merchant vessels and five hundred and thirty boats chiefly employed in the fishery. Denmark. Bornholm.

Nexoe, the second town, is on the S.E. Its beer is celebrated, and ships passing usually take a supply. Its port has been recently improved at the expence of the island. Hasle, on the N.W., Swanike on the east, are straggling villages occupying a large space of ground. There are also some other villages on the coasts, but in the interior are only found some isolated farm-houses at considerable distances.

The barriers of rock that surround the island afford in some degree a natural protection, and it has besides several fortifications garrisoned by regular troops. The defence of the coasts is intrusted to an island militia of 5,000 infantry and cavalry.

The north point of the island is named Cape Hammar, and the south Cape Due. Off the N. E. coast, at six miles distance, are the Ertholmen islands, about twenty in number, but Christianoe, Fredericksoe, and Grosholm, are alone of any consideration: between the two first is a spacious port, defended by a castle on one island and a battery on the other.

The north point of Jutland is named Scagen, and by English seamen the Scaw. It is surrounded by a reef several leagues in extent, and on its Jutland.

Denmark. Jutland.

its extremity is a light-house, sixty-four feet above the level of the sea.

Proceeding southward from the Scaw we meet in succession with Osterby, Bryen, Scagen, an opulent little town, Kareldbek, and Aalbek, all chiefly inhabited by fishermen and pilots, and situated among barren sands. Fladstrand, six leagues south of the Scaw, has a port protected by three bastions. Saeby, a small town two leagues and a half south of Fladstrand, is succeeded by the villages of Lingsœ, Varsaœ, and Aasœ, all opposite the isle of Lessœ.

Entering the gulf of Limfiord, we first meet the fort of Hals, on the north shore of the entrance, where vessels of too great a draft to ascend the gulf discharge their cargoes. Aalborg, (eel town) four leagues and a half from the sea, on the south shore of the gulf, is the chief town of Jutland, containing 7,000 inhabitants, and having a considerable commerce. Its exports are corn, cattle, fish. 130 to 150 vessels arrive and clear out annually, and it has sixty to seventy trading vessels belonging to it. The other places of any consideration on the gulf are, Nibe three leagues and a half above Aalborg, Lœgstœr, five leagues farther, to which vessels of moderate burden go up, and Nykœbing on the isle of Mor.

Mariager is on the south shore of the gulf of the same name, four leagues from its entrance, and Randers on the north shore of its gulf, five leagues from the entrance; the latter has 4 or 5,000

3,000 inhabitants. Grenaæ is a small town, as is Ebletoft, on the east shore of a large bay, formed by two peninsulas. Aarhus, on the west shore of the bay of Kalde, has 4,000 inhabitants, considerable distilleries and breweries. Horsens, at the head of the gulf of the same name, three leagues and a half from its entrance, has 2,500 inhabitants. Weile is also at the head of a gulf. Denmark. Jutland.

Fredericia, a fortified town on a promontory at the entrance of the Little Belt, has 3 to 4,000 inhabitants, and some manufactures. Its port is inconvenient and badly sheltered, and it has little trade. The merchant vessels passing through the Little Belt pay toll here. Snoghoe, a hamlet of two or three habitations, on a sandy hillock projecting into the sea, is the usual crossing place to Middelfart in Funen.

Colding, at the head of a gulf and at the mouth of the little river Aue, which separates Jutland and Sleswick, is a commercial town of 2,000 inhabitants, and has a royal castle. Its port is two miles in circuit, and has a depth for the largest vessels.

Hadersleben is the first place of any consideration in Sleswick, is two leagues and a half up a narrow gulf, has 4,000 inhabitants, and a port for small vessels. Apenrade, on the gulf of the same name, has a port for middling sized vessels and some trade. Flensborg, at the head of a gulf six leagues from its entrance, is the most populous Sleswick.

Denmark. Sleswick.

pulous and commercial town of Sleswick, having 12,000 inhabitants. It is defended by a castle, has numerous distilleries, a sugar refinery, a tobacco manufactory, tanneries, manufactories of paper, sail-cloth, cordage, bricks and tiles, and three merchants' building yards. At the entrance of the gulf are some banks, but the largest ships can go up and lay in the port off the town, which however, requires to be occasionally cleared of the mud carried into it by a little river. Its trade is chiefly with the Danish islands and Norway. Its exports are brandy, corn, provisions, hides, &c. It has 120 commercial houses, and in 1782 had 134 vessels of six to 100 lasts; in 1788, 156 of ten to 120 lasts; in 1797, 257 of ten to 140 lasts, manned by 1,600 seamen.

Sleswick, the chief town of the dutchy, is at the head of the Gulf of Slie, seven leagues from its entrance, has 6,000 inhabitants, some handsome buildings, manufactories of cambricks and thread. It was antiently one of the Hanse towns, but its trade is much declined. The natural entrance to its port being filled up with sand, a canal has been cut into it with thirteen feet depth. Kappel, on the west shore of the entrance of the Gulf of Slie, is an opulent little town, the inhabitants of which, amounting to five or 600, farm the fishery in the gulf. Eckernforde, at the head of the deep gulf of the same name, is a handsome town with wide streets, planted with rows of trees; and with a spacious and secure port.

The

The principal port town of HOLSTEIN, in the Baltic, is Kiel, at the head of the gulf that separates the dutchies of Sleswick and Holstein: it contains 7,000 inhabitants, has an annual fair in January, and an university. (See canal of Holstein or of Kiel.) A packet sails between this town and Copenhagen. The entrance of the Gulf of Kiel is defended by the fortress of Christianspriis, or Frederiksort, on the west shore. Holstein.

The other ports of Holstein are Hochfield, Lutgtenburg, on a little river that falls into the Bay of Colberg, Heligenhafen, within the island of Femern, and Neustadt, on a bay of the Gulf of Lubeck.

The territory of LUBECK consists of the city, the town of Travemunde, the town of Bergedorp, on the Elbe, in common with Hamburg, the territory called the four countries, some bailiwicks in the dutchy of Saxe-Lauenbourg, and some domains on the frontiers of Holstein. Lubeck

The city of LUBECK is situated on the Trave, five leagues from its mouth, and has thirty to 40,000 inhabitants: it was long at the head of the Hanse towns, and possessed one of the most respectable military marines of the north. After the fall of this association, it still continuing a free imperial city, its commerce remained very considerable, though chiefly confined to transit and commission, exchanging the productions of Germany,

Germany, France, Spain, Portugal, and England, against those of the north. In 1802 it had seventy to eighty merchant vessels of burthen, and in the same year there entered 1,368 vessels, and cleared out 1,234. It has manufactories of cordage and sail-cloth, sugar refineries and tobacco manufactories, and builds merchant vessels. Travemunde is a village of fishermen and pilots, on the north bank of the river; it has a fortress mounting forty cannons. Its port, where vessels above 200 tons lighten to ascend to Lubeck, can hold sixty sail. A packet sails between this place and Petersburg.

Mecklenburg.

The Duchy of MECKLENBURG is bounded on the west by the river Trave, and on the east by the Trebel. Its ports are Rovenhagen and Dassau on the Trave. Wismar, on a bay within the isle of Poel, has a port for large vessels, a considerable trade, and five to 6,000 inhabitants. Beidendorf, Dobberan, frequented for sea-bathing, and Gorts are small places between Wismar and Rostock.

Rostock, on the left bank of the Warnaw, three leagues from its mouth, is the most considerable town of the dutchy, having 13,000 inhabitants. It is the entrepôt of the foreign commerce, exporting the productions of the territory, viz. corn, hemp, flax, hops, wax, honey, cattle, butter, cheese, apples and feathers. In 1807, it had 147 distilleries and sixty-one breweries. The extent of its trade fluctuates with the political events.

In

In 1795, 118 vessels from Rostock, bearing the Mecklenburg flag, passed the sound. In 1790—639; in 1796—196; in 1799—137; in 1800—278. Vessels of burden lighten or discharge at Warnemunde, at the mouth of the river on the left bank, where is a fort to defend the entrance.

Swedish Pomerania.

Swedish Pomerania is bounded on the west by the Trebel and on the east by the Peene. Its ports are Damgarten, at the mouth of the Trebel or Rekenitz, in the basin des Dars, and Barth on the same basin, both only capable of receiving small craft under six feet draft.

Stralsund, the chief town, has 10,000 inhabitants. It was formerly fortified but is now open. Its port is enclosed by jetties, but its access is difficult from sand-banks, and is defended by some works on the little island Dænholm. It has a considerable trade, exporting brandy, starch, linens, woollens, &c.

The other ports are Greifswald, on the Ryck, which forms a good port; the town is well built. Wolgast, within the isle of Ruden, Lassham, within the isle of Usedom, and Frazendorf, on the left bank of the Peene.

We have already noticed, generally, the islands off the coast of Swedish Pomerania. Zingst, the westernmost, is a long narrow strip of land, partly enclosing the basin des Dars: on it is the village of Hinterwish.

RUGEN

Rugen Island. RUGEN ISLAND is separated from Pomerania by the Strait of Gellen. Its shape is so very irregular, that no determinate length or breadth would give any idea of its size, but it is calculated to contain 142,000 acres. It consists of the island proper and three peninsulas, Jasmund on the N.E., Wittow on the north, and Mongath on the S.E. These different parts have several elevations, called mountains by the natives. The peninsula of Jasmund is terminated by a promontory of chalky cliffs, resembling the ruins of an immense building, interspersed with trees, and from which a torrent tumbles with impetuosity into the sea, above which the highest part of the promontory is 480 feet. The peninsula of Wittow also terminates in a similar but less elevated promontory, named Arcona. Chalk predominates in these two peninsulas; the general soil of the other parts is sand and clay mixed with shells: blocks of granite are also met with, and the north coast, in particular, is covered with pyrites, fragments of coral and jasper, and porphyry. It also affords china earth and clays for pottery.

The island is well watered by lakes and rivulets and produces all kinds of grain and vegetables in the greatest abundance. It has good horses and excellent horned cattle; but the sheep are inferior. The wild animals are deer, hares, and foxes. The Rugeners breed great quantities of geese which they smoke for exportation.

In the middle of the peninsula of Jasmund, 400 feet above the sea, is a large lake, near which are several

several ancient mounds and ramparts of earth, supposed by the natives to be the burying places of the Huns,* a number of earthen vases being found in the mounds. Rudely cut large square stones are also met with in several parts of the island, which are supposed to have served as altars. Rugen Island.

The population of the island is 25,000. The Rugenders are extremely industrious, the produce of the soil, their cattle, geese and the herring fishery supplying them with objects of foreign commerce, and which they export from some roads (the island having no port,) and particularly from the village of Schaprode on the west. The annual export of corn from the island is 1,600 lasts.

The island has two towns and several villages. Bergen, the chief place, is near the N.E. part of the island of Rugen Proper, and situated on an eminence that commands a view of the greater part of the island. It has 15 to 1,600 inhabitants. Saagard, the second town, is on the interior of the peninsula of Jasmund, has 800 inhabitants, and near it is a mineral spring resorted to both by the natives and strangers.

Rugen belonged to Denmark from the twelfth to the fourteenth century, when it passed by convention to the Dukes of Pomerania, whose house becoming extinct, Sweden got possession of its territories by the peace of Westphalia, in 1648, when Rugen was erected into a principality, to which

* These mounds, of which there are others in various parts of the island, are called Hunengraebre, which properly signifies giant's graves: they are usually between forty and sixty feet long.

Rugen Island. which was attached the office of Grand Huntsman of the Empire.

The neighbouring parts of the continent being a monotonous level, the island of Rugen is visited for its picturesque beauties by many Germans, one of whom has elegantly celebrated the promontory of Arcona, the rocks of Jasmund, and its sacred woods and tumuli.

The small islands dependant on Rugen are numerous: the principal is Hidensee on the west, whose inhabitants have little external communications; they speak a rude dialect of the high German, mixed with many Danish, Swedish and obsolete Teutonic words. Their occupations are rearing a few cattle, whose dung is their principal fuel, the island having no wood; fishing for their subsistence, and collecting the amber which is occasionally driven on the shores. Unmantz island, also on the west, is next in consideration; and all the others, amounting to upwards of a dozen, are insignificant.

The coasts of Rugen are celebrated in the annals of shipwreck, scarce a year passing without several vessels being stranded on the shores of the peninsulas and on Hidensee. Several antient regulations are still in force respecting shipwrecks. When a vessel makes the signal of distress, the inhabitants of the coast are bound to hasten to her assistance, and first to endeavour to save the crew. The persons who arrive first are entitled to a preference for salvage, but none is to enforce his services if the crew is alone able to save the cargo.

The

The salvage allowed is also very trifling, and the goods saved are to be taken care of by the magistrates of the district, who are immediately to give notice to the Shipwreck Office. Rugen Island.

The Prussian dominions on the Baltic extend from the Peene to beyond Memel. On the Prussian side of the Peene is the Anclam, with 3,000 inhabitants and some trade. Prussian Pomerania.

The islands of Usedom, Ruden and Wollin are formed by the alluvion of the Peene and Oder: they are very low, in some parts fertile and in others a barren sand. They abound with game and have abundant fisheries. Ruden, the westernmost, is separated from the main land by the channel of Peenemunde, the western entrance of the Gros-Haf. Usedom, the middle island, is five leagues long, but of very irregular breadth: it has a little town of the same name on the west, with 1,700 inhabitants. Wollin is six leagues in circuit, and is separated from Usedom by the channel into the Haf, called Swinemunde. This island has considerable pastures, and a great eel fishery is carried on in the basin within it, called the Fritter. The town of Wollin is on the S. side of the island and on the channel of Divenow, which is the east outlet of the Haf and is crossed by a bridge.

Uckermunde on the Ucker, which falls into the Haf, has 1,600 inhabitants and builds a number of small vessels.

Stettin on the Oder, forty miles from its mouth, is strongly fortified, and has 17,000 inhabi-

Prussian Pomerania.

tants. Vessels of moderate burthen go up to it, and large ones discharge at Swinemunde. Its trade is very considerable, exporting ship-timber chiefly to England, fruits to Russia,* the linens of Silesia, &c. The imports are manufactured goods from England, salt, wines and fruits from France, Spain, and Portugal, and linseed from Russia. Of late years it had 160 merchant vessels of burden (13,000 lasts) and manned by 1,000 seamen. It has considerable manufactures of woollens, linens, soap, oil, paper, tanneries and distilleries. The little town of Dram above Stettin has an annual linen fair; and from Politz, near the mouth of the Oder, are exported several thousand bushels of hops, chiefly to Sweden.

The other ports of Prussian Pomerania are Camin, Traptow, Tornhaven, Langenhagen, Colberg, a strong fortress at the mouth of the Persante, Schulzenhagen, Cassimirsburg, Coeslin, Rugenwalde, Stolpemunde, Smollin on the Laipow, and Leba on the shallow lagoon called the Leba sea.

In Polish Prussia are Hela, at the extremity of the long peninsula that forms the bay of Putzig, a village where vessels bound to Dantzick take pilots.

Prussian Poland.

Dantzick is a very strongly fortified city with 42,000 inhabitants: it is situated on the main, or western

* Chiefly apples and pears. Between 1270 and 1776, the annual average export was 1,767 tons; between 1777 and 1786, 2,053 tons; between 1787 and 1796, 3,714 tons.

western branch of the Vistula five miles from its mouth, and at the confluence of the little rivers Motlau and Radaune, which form its port, and to which vessels arrive by the artificial canal, called Neufahrwasser, cut to give a new channel to the Vistula, the old one being choaked up. The entrance of the channel is defended by the forts of Weixelmunde and Wester Schantze. Dantzick is solidly but not handsomely built, the vestibules of the houses projecting into the streets, disfigure them. The houses are generally five stories. The principal public edifices are the arsenal, a lyceum, cabinet of natural history, astronomical observatory, twelve Lutheran, two Calvanist, and seven Catholic churches. It has vast magazines to receive the corn of Poland and four building yards. It has manufactures of gold and silver lace, woollens, morocco leather, saltpetre, vitriol, steel, potash, brandy, and liqueurs. The exports are rye, barley, and malt, oat, peas, timber, beer, brandy (12,000 bar.) horse-hair, hog's bristles, feathers, wool, amber, honey, wax and linens. The imports, English manufactures and London porter, Dutch and Swedish herrings, Brasil wood, oranges, lemons, and other fruits, lead, coffee near two millions of pounds, tea about 30,000lbs., raw sugar about two millions of pounds, refined ditto one million and a half, indigo 16,000 lbs., French wines 6,583 pipes. In 1798 the exports amounted to 5,883,921 German crowns, and the imports to 1,925,396. In 1802 the movement of the port was as follows:—

Prussian Poland.

VESSELS.

	Entered from.	Cleared out for.
England	505	526
Denmark	366	279
East Friezeland	274	—
Holland	261	474
Sweden	186	129
Prussia	86	42
Bremen	43	14
France	22	144
Spain	2	47
Italy	2	10
America	1	1
Russia	—	11
Tripoli	—	1
	1,748	1,678

About eight miles west of Dantzick is the convent of Oliva, composed of vast buildings and extensive gardens. It is celebrated for the signing of the treaty which, in 1660, put an end to the long and bloody wars between Russia, Denmark, Sweden, and Brandenburg.

Pillau is a fortified town on a peninsula, washed by the Fisch Haf on one side, and by the Baltic on the other, and which from its fertility and agreeable climate is called the paradise of Prussia. Fischhausen is a small town between Pillau and the Pregel.

Königsberg, the capital of Prussia Proper, is built on an island in the mouth of the Pregel, which

which communicates with the main by seven bridges; the entrance of the river being crossed by a bar, with only seven feet, vessels of greater draft discharge into flat boats at Pillau. Königsberg has several magnificent palaces, a strong citadel, an university, and an exchange: its population is 55,000. It exports the same objects as Dantzick, by 600 to 700 vessels annually. Its chief manufactures are woollens, linens, ribbands, soap, and leather. Prussian Poland

The other places of any note on the Frisch Haf, are Braunsberg on the Sarm, Frauenburg on the Passarge, a small insignificant town, but which contains the remains of Copernicus who died canon of its college. Elbing, at the mouth of the river of its name, which issues from lake Dramsen, has 18,000 inhabitants, and exports to a considerable extent, corn, starch, linseed oil, soap, cordage, sail-cloth, saltpetre, and potash. It receives annually between 300 and 400 vessels.

On the Curisch Haf are many villages, but few places of any consideration; except Memel, on the Dange, which has 6,000 inhabitants and is well fortified. Its port, formed by the mouth of the river, is liable to be encumbered with its mud. In 1800, the greatest depth was sixteen feet, but it has since been deepened and barriers constructed to keep it free. On the north side of the entrance is a light house, 165 feet high, which is seen when it bears on the points between S. and N.E. The chief exports of Memel are ship timber, masts, planks, rafters and laths, the produce of the

Prussian Ports and Coast.

forests of Lithuania floated down the Niemen; also linseed of a superior quality, hemp, flax, hides, and tallow. In 1800 the entries were

English	353	Mecklenburg	7
Russian	128	Lubeck	6
Danes	38	Hamburg	2
Swedes	26		
Pepenburg	12		584
Oldenburg	12		

In 1801, Memel had twenty mercantile houses, of which eight were foreign, viz. three English, two Lubeck, and two Danes. An annual fair is held here, at which the Jews purchase to the amount of 450,000 German crowns, chiefly of manufactured goods and colonial produce, for the consumption of the interior of Poland.

Palagow is the last place on the coast in the Prussian territory, and here is an office for the examination of travellers going into Russia.

Russia.

Courland.

The province of Courland has but two ports of any consideration, Liebau and Windau. Liebau on the river of the same name has 5,000 inhabitants, and exports the produce of the province, consisting of corn, linseed, cattle, hides, and tallow. Its port at the mouth of the river is indifferent. In 1800, 113 vessels entered and 111 cleared out: in the same year the value of the exports was 1,065,700 rubles, and of the imports 620,000.

Windau has a tolerable port at the mouth of its river, which seldom freezes, and with some improvements might be made capable of receiving 100 ships of the line.

The principal ports of Livonia are Riga and Pernau.

Livonia. Riga, on the Duna, is one of the most commercial cities of the Baltic, and the second of Russia in that respect. It is situated in a plain, on the right bank of the river, surrounded by sandy hills. Its port can only receive small vessels, large ones being obliged to lay in the roads, which are much exposed, or opposite Bolderaa, south of the entrance of the Duna. The city is tolerably fortified by works of masonry along the river, and by strong walls towards the land. It has also a citadel, with six bastions and three ravelins, and surrounded by a ditch, which receives water by an aqueduct from a lake a mile distant. The population in 1812 was 30,000, chiefly of German extraction, and speaking the German language. It has eleven churches. The Duna is crossed at Riga by a bridge of boots, 2,600 feet long and forty broad, which is taken to pieces every winter when the river begins to freeze.

The trade of Riga is chiefly carried on by foreigners, particularly the English, who have here a magnificent factory. The exports consist of the natural productions of the Russian empire, such as corn, hemp, flax, ship-timber, masts, planks, rafters, staves, pitch, potash, hides, tallow, and iron. The corn is sent chiefly to Sweden, Holland, and Russian ports. The hemp is esteemed thirty per cent. superior to that of Petersburg. The imports are London porter, woollen and cotton manufactures, and hardware of England; French and Spanish wines, oils, and spirits, and colonial produce.

Russia. Livonia.

produce. The increase of commerce, from 1790 to 1808, has been as follows:

In 1790 the exports exceeded 6½ mill. of rubles.
In 1804..... 12
In 1808..... 15½

During the same period the imports have varied from six to eight millions. The number of vessels that arrive annually is 1,000 to 1,100; and those that sail, 900 to 1,000. In 1804 the exports were (omitting small numbers) as follows:

To England	5,320,000 rubles.
Holland	1,358,000
France	414,000
Spain	1,550,000
Portugal	827,000
Italy	74,000
Prussia	160,000
Embden	249,000
Sweden	654,000
Denmark and Norway	993,000
Elseneur	84,000
Lubeck	348,000
Rostock	70,000
Bremen	61,000
	12,162,000

An annual fair is held at Riga, which lasts from the 20th June to the 10th of July.

On the mouth of the Duna, on the left bank, is the little fortress of Dunamunde, entirely surrounded

rounded by water. Independant of its being the chief defence of the river's mouth, it is an insignificant place, of not more than twenty houses and a Russian church. Pernau has only a road, and Lemsale is a small port between it and Riga. Habsal, within the island of Dagoe, has likewise only a road. Russia. Livonia.

Entering the Gulf of Finland we meet in succession with Ryback, Wintz, and Balticport, formerly called Roggerswick, a deep bay, enclosed by islands. Peter the Great conceived the idea of making it the chief station of the Russian fleet, and commenced the necessary works, but which were discontinued at his death; and though Catherine the Second caused them to be resumed, the violence of the waves and the position of the rocks have opposed such obstacles to the completion of the plan, that they have been again discontinued, nothing more being done than fortifying some of the islands, to protect the vessels that may occasionally run in for shelter or safety.

REVEL, or REVAL, has the best port of the province, but its entrance is through dangerous shoals, and the river on which it is situated affords no communication with the interior. It was formerly a Hanse town, but in 1710, when the province was ceded to Russia, it lost its privileges. Its commerce is still considerable, the objects being the same as at Riga. The amount of its exports and imports have varied as follows:

Exports.

Russia.
Livonia.

	Exports.	Imports.
	Rubles.	Rubles.
1780	473,000	151,000
1788	259,000	113,000
1792	2,944,000	108,000
1795	1,765,000	417,000

In late years the average of exports has been only from 5 to 600,000 rubles, and of imports from 150 to 200,000. The number of vessels that enter annually is 100 to 120. It has two annual fairs, a foundery of cannon, is well fortified, and contains 8 to 9,000 inhabitants.

NARVA, on the river Narowa, eight miles from its mouth, and twenty-four miles from Lake Peipus, is built entirely in the Dutch style, the houses being of brick. It formerly belonged to the Hanse, and still retains a considerable trade in the same objects as Riga and Revel. According to the ancient division of Russia, Narva was partly in Estland and partly in Ingria, but by the present divisions it is in the government of St. Petersburg.

ST. PETERSBURG is built on both banks of the Neva and on several islands; it has six miles extent in every direction, and a population of 241,600, of which 22,700 are foreigners, *viz.* 18,000 Germans, 2,300 French, 1,500 Swedes, and 900 English. The mouth of the Neva is choaked by sands, over which are only seven to eleven feet water, according as the wind is from the East or West; hence loaded ships of burden cannot approach

proach the city within four miles, and the large men of war built here are floated over the bar by camels,* which raise them eleven feet.

Ingria.

The Neva at Petersburg forms three branches, uniting both by nature and art with several rivulets. The greater part of the left bank of the principal branch is lined with blocks of granite, forming a superb quay, and the two largest rivulets, the Fontanka and Moika, are lined in the same manner. The water of the river is used for all domestic purposes, though it was supposed to produce cholics, dysenteries, and cutaneous diseases; a careful analysis has however proved that it contains no substance capable of causing these maladies. With easterly winds the river often falls three or four feet below its general level, and in westerly ones sometimes rises from ten to fifteen feet. These elevations formerly did much damage, but are become much less dangerous since the banks of the river have been raised and quayed in.

The manner in which the Neva begins to freeze and to break up, is worthy of notice. Lumps of ice are first seen floating, when the bridges are immediately taken to pieces. For one or two days the

* The camel is a machine invented by the celebrated De Witt, for the purpose of floating large ships from Amsterdam over the Rampus. It is composed of two water-tight boxes, whose outsides are perpendicular, and the insides shaped so as to fit the bottom of the vessel; each part has a small cabin with ten plugs. When about to be used, as much water as is necessary to sink them is let in by the plug holes, and when properly fixed under the vessel, the water is pumped out, and the vessel is gradually buoyed up.

Russia. Ingria.

the pieces of ice drift with the stream, and the river is crossed in boats; but the increase of ice is so rapid, that it is common to see in the interval of two hours, the river covered with boats and with people on foot. The breaking up of the ice almost always takes place suddenly. As the spring arrives, the thawed snow forms a spongy kind of ice, which, as the water penetrates it becomes of a black colour; the ice itself beginning to melt, clear spots are formed while the beaten paths still remain firm, and the river is crossed both in boats and on foot. At length the icy roads themselves fall to pieces, and the ice floats in large masses down the stream. The ice in the lake Ladoga does not begin to break up until some days after the river, and the pieces continue to issue from it for two or three days, bringing with them a great increase of cold.—When the river is free from ice, three guns are fired from the fortress, and at this signal the commandant embarks in a boat, hoisting the flag of the city, and followed by several others, proceeds before the fortress, which he salutes with seven guns, and is answered with five. Before this signal no boat is permitted to venture on the river, and while it remains open a gun is fired morning and evening.

The streets of Petersburg are all straight and very wide. It has 4,000 houses of wood or of brick painted to resemble stone, and seventy churches, in which divine service is performed in fourteen different languages. The fortress, which

is in the middle of the city, contains the mint, the archives of the empire, and what still more attracts the notice of travellers, the boat named the Little Grandsire, constructed at Moscow for Alexis, the father of Peter the Great, and which gave the latter the first idea of a marine. Russia. Ingria.

The principal exports of Petersburg are iron, hemp, flax, cordage, tallow, hides, linseed oil, hemp and flax seed, planks and rafters, leather, soap, candles, wax and honey, fish, cavier, tobacco, rhubarb, tea, isinglass, feathers, coarse linens, furs. The number of vessels that enter annually is from 1,000 to 1,200, and the number that sail from 900 to 1,000. Four to five hundred English vessels take off annually one million and a half puds of iron, and two million puds of hemp. The variation of the commerce of this city since 1742 has been as follows.

	Exports. Millions of Rubles.	*Imports.* Millions of Rubles.
1742	2½	2
1757	4½	3
1774	9	7½
1777	14½	9½*
1778	12¼	8
1780	11	8½
1785	13½	10
1789	18½	15¼
1790	13¼	12¼
1793	24	14½
1805	30	20

The

* This year England took off for nine millions, and imported for three millions.

Russia. Ingria.

The principal imports are English cotton manufactures for upwards of two millions; French wines for two millions; colours one million and a half; coffee one million; drugs half a million.

The movement of the port of Petersburg in 1810 was as follows.

Large vessels entered from sea	636
Small craft ..... ditto	5,538
From the interior by the inland navigation	4
Wodowick's	846
Loaded boats	4,750
Empty ditto	4,005
Boats with passengers	60
Yachts	71
Sloops and barges	16

The foreign mercantile houses established at Petersburg in 1790, were twenty-eight English, seven Germans, six Dutch, four Danish, four French, two Swiss, two Portuguese, one Spanish, one Italian, and several Prussian. All disputes respecting trade are arranged by a board of trade established by Peter the Great, composed of natives and foreigners. All vessels are obliged to discharge their cargoes at, and ship them from the custom-houses of Petersburg or Cronstadt, to prevent smuggling.

Cronstadt, the principal station of the Russian fleet, is built on a little island in the gulf of Petersburg, four leagues below the city, four miles from the coast of Ingria, and nine from that of Finland.

land. Its name in Finnish was Retusari, which the Russians changed first to Kotlot Ostroff, or Cauldron Island, and in 1723 Peter the I. gave it that of Kron-stadt or Crown City. It is about six miles long and from half to one mile broad; is almost entirely composed of sand, except a ridge of granite running through the middle. The town is on the S.E. extremity, and has a population of 30 to 40,000 persons, of whom 250 only are free citizens. 3,000 are soldiers, 10,000 seamen; the remainder is made up of artificers and labourers in the arsenals, domestics, &c. It has some good buildings of brick plaistered, amongst which are the barracks, marine hospital, an hospital for the workmen and others, a navigation school, &c.

Russia. Ingria.

The fortifications of Cronstadt are towards the sea a jetty of piles, and towards the land a rampart. It has three havens, two for ships of war, and the third for merchant vessels, which are separated by two jetties of granite. The grand canal began by Peter the First and finished by Elizabeth in 1752, is 238 fathoms long, fifty-six feet broad, and twenty-five deep. It is entered from the sea, and communicates with dry docks, which have a length of 150 fathoms more. It forms a cross, of which the middle is circular, and is entirely lined with granite. It requires nine days to empty the dry docks when full. The water is let out by a sluice into a reservoir, from whence it is pumped by steam-engines into a canal that communicates with the port. The prin-

Russia. Ingria. principal man-of-war's port has space for thirty sail of the line, but there is not depth for such a number, and hence, several are obliged to remain in the middle port; the principal port is defended by bastions of granite or wood. The merchant's haven is closed by a boom, and defended by a battery on each jetty head.

The channel to Petersburg is between Cronstadt and the coast of Ingria, and is narrowed by shoals to three-quarters of a mile: the depth is only four fathoms. On the Ingrian side of the channel is Cronslot Castle, on a sand-bank. It is a round building, supported by many outworks on that side of the channel, mounting fifty guns. On the Cronstadt side the channel is defended by St. Peter's battery mounting 100 guns. The channel between Cronstadt and the coast of Finland has only five feet water.

Oranienbaum, on the coast of Ingria opposite Cronstadt, is a royal residence, built on an artificial terrace 100 feet above the level of the sea. It has but two stories, and is composed of a centre and two wings united by long collonades.

Finland. Gulf of Finland. The principal ports of Russian Finland are Wyborg, built on a peninsula in a large and tolerably clean gulf. It exports all the productions of this portion of the Russian dominions, consisting of corn, butter, tallow, fish, fish-oil, salted provisions, timber, tar, and hops. In 1793 the value of the exports was 124,832 rubles, and of the imports 120,000. Its population is 9,000.

Fredericksham, a port and fortress; the town

A small but regular, the houses of wood neatly built. The fortifications are respectable and in good order, and it has a garrison of 6,000 men. It exports some planks and tallow. Finland. Gulf of Finland.

In the former Swedish Finland are Lovisa, anciently called Degerby, and Borgo, both at the mouths of little rivers which fall into rocky bays. Lovisa is protected by the fort of Swartzholm, *Black Island*. Helsingfors, the best port of Swedish Finland for large ships, is on a bay, and opposite it is Sweaborg, a strong fortification, occupying seven islands, of which the principal is Wargoe, or Wolf Island, which has barracks, extensive magazines, and an arsenal, all bomb-proof. Here are two basins for repairing ships of the line and small vessels. Although these islands are naked rock, several spots of them have been covered with soil, and made to produce fruits and vegetables. Sweaborg may be considered as forming a town, having several commercial houses, manufactures, &c. A short time after the cession of Swedish Finland to the Russians, in 1809, a magazine at Sweaborg blew up with 100,000 pounds of powder, by which 100 persons lost their lives, and the works sustained considerable damage.

Pelting Sound, eleven leagues east of Sweaborg, is surrounded by rocks rising like a wall, and sheltering it from all winds: the Pelting scars are among these rocks, and Putsfagre rock is five leagues east of the sound.

Ekhaes is a small town in a bay, east of Hangoe Head.

Finland. Gulf of Finland.

Head. In the entrance of the bay are several islands, with only seven to eight feet in the channels between them.

Gulf of Bothnia.

Abo, the chief town of Swedish Finland, is situated at the entrance of the Gulf of Bothnia, on a peninsula formed by the Aurajocki, which is here sixty to 100 yards wide, and is crossed by a bridge. Vessels drawing nine or ten feet, go up to the town, but those of greater draft are obliged to anchor three miles S.W. of the river, near Bechtholmen, where is a good harbour, and from whence their cargoes are transported in small craft to Abo. The town is regularly and well built; the houses are of wood, except those of the chief officers, which are stone. The entrance of the river is defended by the castle of Abohus, on a point of land surrounded on three sides by the water. It is one of the most antient fortresses of Finland, was one of the prisons of Eric XIV., and still serves as a state prison, as well as a depôt of military stores. Its garrison is two companies of marines.

Abo, when belonging to Sweden, was a staple town, with some trade to the Mediterranean, France, and Holland. Its exports are iron, nails, copper, deals, rafters, pitch and tar, salted provisions, hides, furs, coarse linens, fire-wood to Stockholm and Copenhagen, and tiles. Vessels are built here for sale. The population of Abo is 10,000. It is an archbishopric and has an university.

In proceeding north from Abo we meet Nadendhal,

handhal, Nystad, Raumo, Biörneborg, one of the chief ports of Finland exporting the same objects as Abo, Christianstad, and Wasa, a staple town of seventeen streets, at right angles, and of great breadth. In 1790, it contained 384 houses, all of wood, and generally of but one story, and 455 families. It equips nine seamen for the fleet. Its exports are rafters, deals, pitch, tar, rye, butter, seal-oil and skins, and tallow. Vessels of fir for sale are constructed here. The duties paid at the sea custom-house in 1791, amounted to 1,816 rix-dollars. It has two harbours, called the Old and New: the former is of difficult access, but the new one, which is a mile distant, is safe and convenient. Here is a manufactory of woollen cloth and some tanneries. Finland. Gulf of Bothnia.

In following the coast from Wasa, we find only a succession of single habitations, or at most two or three inhabited by peasants and fishermen. The coast is naked, stony, lined with rocks and islets, and totally bare of vegetation.

Gamla Carleby is a small town with ten streets, at right angles, each twenty feet wide. It had in 1790, 214 houses, 328 families, or 1,367 inhabitants. The port is only accessible to vessels drawing twelve feet, but it has a loading place for large ships near Kalajocki to the north, where vessels are also built for sale. In 1794 it had fourteen ships (or 1,530 tons), thirteen of which were employed in foreign trade, in and out of the Baltic. The exports in the same year were, tar 1,800 barrels, pitch 1,500 barrels, deals three to

Finland. — Gulf of Bothnia.

4,000 dozen, butter 2,000 pounds, tallow 273 cwt. corn 900 barrels. The amount of duties at the sea custom-house was 2,072 rix-dollars. It has manufactories of printed cottons, tobacco, and some tanneries.

Between Gamla Carleby and Brahestad, are only met with single houses of peasants and fishermen. Brahestad is a staple town, on a bay between two peninsulas. In 1799 it had 124 houses and 225 families. In 1794 it had fourteen ships (or 1,054 tons), of which from four to six were employed in foreign trade. The exports in 1790 were, tar 1,444 barrels, butter 10,000 pounds, tallow 1,571 cwt.; besides pitch, skins and furs, deals, salmon and other fish. In 1791 the duties of the sea custom-house produced 1,985 rix-dollars. Its harbour is daily filling up.

Uleoborg is the chief town of East-Bothnia. It is situated on the Uleo, has sixteen streets, and in 1799, 3,800 inhabitants. It was a staple town, and exported annually a considerable quantity of pitch and tar, deals, butter, tallow, salmon, pike, and herrings. It had four ships employed in foreign trade. On the islands at the mouth of the river are two building places, from which five or six ships are launched annually. The road grows shoal, and ships are now obliged to anchor two miles from the town, where they are loaded and discharged by lighters. Near the town are some mineral springs. The river, whose current rolls with great rapidity, has a good salmon fishery.

Kemi,

Kemi, at the head of the Gulf of Bothnia and on the river Kemi, is chiefly remarkable for a church built in the Grecian stile, which singularly and painfully contrasts with the miserable wooden huts that compose the town. In the middle of the river is a small island, where an annual salmon fair is held. Finland.

At the north extremity of the gulf of Livonia are the islands Œsel and Dagœ; they are not high, and are composed chiefly of calcareous rock, free stone, sand, and clay. Their pastures are proper for sheep, and they also have a small breed of horses. Œsel is fifteen leagues long, and four to six broad. Its south point is named Swaverort, on which is a light, and the north Palmerort. This island produces some corn and flax for export, as well as cattle. Arensberg is the only town, but it has some considerable villages, particularly Hundswik on the N.W. Russian Islands.

Dagœ is separated from Œsel by Œsel Sound; its shape is very irregular. The north point is Syburg Ness, forming two distinct points, with a reef off each; but between them a clear space, with good anchorage. Dagerort, the west point, has a light. Round Œsel and Dagœ are many small islands, inhabited by pilots and fishermen.

Of the numerous islands and rocks in the gulf of Finland, the most worthy of notice are—

Fiorka islands, three in number, off the south point of the entrance of the gulf of Wyborg.

Rahsten Islands.

Ingholm.

Ligo, Aspö, and Leskar rocks, four leagues south of Fredericksham.

Fisher's, great and little; Hetti, between Fredericksham and the gulf of Wyborg.

Hochland, nearly in the middle of the gulf, has two lights on the north end.

Kokskar, with a light.

Kalbaden reef, with seven feet, eight leagues south of Borgo.

Lovenskar, Peni, Sommeos, Narva, Serkar, Lang, and covered with trees, all lay west of Dalgruhnt point.

Nargen island, before the bay of Revel.

Nyground, three fathoms water, N.E. of Odensholm.

Odensholm island, with a light, two miles N.W. of Spinthammar point.

Archipelago of Aland.

The archipelago of ALAND is composed of one considerable and many lesser islands, islets, and rocks, above eighty in all. They are, in general, elevated, rising in rocky peaks, with numerous caverns: their base is a reddish granite, mixed with feldspath, mica, and quartz. A few calcareous spots are also observed, one of which is 1,000 feet from the shore. Masses of limestone, rock christal, clays, argile, and vast quantities of shells, cover the primitive rock, and traces of lead ore have been met with. The whole archipelago possesses only about 4,000 acres of arable land, which produces wheat, barley, rye, and oats, sufficient for the consumption of the inhabitants, whose

whose numbers have increased in the following progression:—1749, 8,938; 1790, 11,884; 1800, 12,354; 1805, 13,340.

Russian Islands. Archipelago of Aland.

The principal trees are pines and birch, and though they have been long cut for exportation, they still afford above the consumption of the islands 12,000 cords a year, which is sent to Finland and Sweden. The grass is short and poor; the cattle are numerous but small; and the cows have seldom horns. In 1806, there were 2,760 horses, 140 bullocks, 3,780 young oxen and heifers, 8,100 cows, and 12,380 sheep. In the mountains are numbers of wild goats; and the woods anciently had stags, but which have been all destroyed. The lakes and torrents are numerous, and full of fish, of which, however, they want two species which abound in the waters of Finland,—salmon and eels.

There is no town on the islands, and but few collections of houses that even deserve the name of villages. Besides fire-wood, they export salted beef, tallow, hides, and butter, chiefly to Stockholm. The pilchard fishery, and the oil and skins of seals, also afford objects of export. The islands are divided into eight parishes, with each its church; the revenue they produce to government is near 20,000 rix-dollars; and they furnished 898 registered seamen to the fleet. The Alanders are a colony of Swedes, and speak the Swedish language. They were ceded to Russia with Swedish Finland, in 1809.

The

Russian Islands.

Archipelago of Aland.

The principal isle of Aland is nearly round, and twenty leagues in circumference. On the west side, and on a nearly insulated rock, are the remains of the ancient fortress of Castle-holmen, one of the prisons of Eric XIV. Its ruins are surrounded by a little village, consisting of the post-house, some shops, and peasant's huts. Fredenby, on the west, has only a house for the reception of travellers, and a peasant's cabin. Harroldsby, on the east, is equally insignificant, but has several mills turned by a stream.

Signal Scar, the western island, has no trees, and only a few peasants' huts: a telegraph on it communicates with another at Grisleham, in Sweden. Ekerœ, west of Aland, is of some consideration, containing sixty royal farms, fifty windmills, and a church. It produces corn and is well wooded. Skopas, has only a house for travellers, and three or four peasants' cabins. Vergata, Kumlinga, Brandœ, Vernala, Helsinga, have only a single habitation each, but all have wood. Lumperland and Waldoe are almost of as little consequence; and Himois Laitis, Nymen, Kylœ, and Humi-Kylœ of still less; all the rest to the number of above sixty are generally barren rocks.

HISTORICAL ESSAY

ON THE RISE, PROGRESS, AND PRESENT STATE OF THE COMMERCE OF THE BALTIC.

First Period.—To the Crusades.

Though the commerce of amber probably produced some relations between the people of the south and those of the north, in remote antiquity, the traces of them are too obscure, and the indications to be found in the writings of the ancients, as to the native country of this production, too vague to establish by what route it arrived at Tyre, at Alexandria, and at Rome, the successive emporiums of the commerce of the Mediterranean; for although it seems certain, that the greater part of it was procured from the north, it is impossible to decide whether it was from the coast of Germany, and the Cimbrick Chersonesus on the German ocean, or from the coast of Prussia.

When the devastations of the barbarians had ceased, and knowledge and industry again dawned in the countries of the south, the Baltic and the neighbouring seas began to be known, though not yet as the theatres of commerce. These seas were then covered with hardy adventurers, who feeling

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feeling that vague inquietude, that necessity of active employment, which is the first symptom of awakening civilization, considered war as the only occupation worthy of men. The sharp air of the mountains exalted their ideas; their courage was inflamed by a religion, which amongst savage rocks and torrents had acquired a rough and martial character, and the greatest robber was esteemed the greatest hero. Equally expert in the use of the sail and oar,* they did not confine their excursions to the Baltic, but boldly braving the ocean, invaded and conquered the Zetland islands, discovered and colonized Iceland and Greenland, and probably even America. But the greater number directed their courses to the more fertile regions of the south; and, in the ninth and tenth centuries, the Norwegians, Danes, and Swedes, under the general name of Normans, or men of the north, poured like torrents on the coasts of Germany, France, England, and even Italy. Devastation and ruin marked their steps; Paris was sacked and burned by them three times, between 857 and 883, and at last their forbearance was only

* The first vessels used by the northern nations in their piratical excursions were either the trunks of trees hollowed, or osier frames, covered with hides. The largest were called chiule, cyule, ceol (whence keel, quille), and the greatest contained 200 men. Osier boats are still in use in England, as they were in the time of Cæsar, on the Dee and Severn, where they are called coracles; in Ireland they have the name of curacks. The karabia of the ancient Greeks were similar boats covered with hides. The baidar of the Oczenbaiden, Esquimaux and Kemtschadalas, are formed of the bones of whales, or laths of wood covered with the skins of sea-animals.

only purchased by the cession of the kingdom of Neustria, which from them took the name of Normandy. In England the great Alfred, for a while, checked their audacity; and during the latter part of his reign, the kingdom was free from their incursions: but, under his successors, they were renewed, and after they had deluged the country with blood, Sweno, the Dane, plucked the crown from the head of the treacherous Ethelred. A. D. 1004.

The expeditions of the Normans were at the moment calamitous to Europe; but that Providence which presides over the chain of causes and effects, sometimes permits great catastrophes as the means of producing great benefits. Although the people of the South were still in the infancy of civilization, they were farther advanced than those of the North; and the latter having past the barriers which had hitherto separated these two parts of Europe, could not observe this superiority without their intellectual faculties receiving a great impulsion. They insensibly mixed political motives with their projects of booty, and in the midst of their piracies they caught a glimpse of the advantages of commerce.

These first dawnings of improvement in the North were productive of a more concentrated social existence, and of a desire of communication by means of exchanges, mutually advantageous. Establishments were formed on the coasts, where the warriors bartered the plunder taken in their

their excursions for cattle, and for the produce of the chase and fisheries. Their chiefs granted tastes to the traders, and sometimes even took them under their protection; and in this manner the northern people not only communicated with each other, but in the intervals of peace with England they visited that country as traders. These elements of civilization were developed by the introduction of christianity, whose influence changed the moral aspect of the North in a great number of respects. The missionaries and the first clergy were all foreigners, who both taught and practised agriculture and the useful arts; their proselytes collecting round their churches, villages and towns arose, and the wandering and piratical Scandinavians were gradually transformed into industrious citizens. Writing was introduced or perfected, and money beginning to circulate, facilitated commercial exchanges.*

Middle period.—From the Crusades to the fall of the Hanseatic league.

While a new order of things was establishing among the people of the North, a great spring of activity was developing itself in the South. The crusades extended the sphere of ideas, and produced

* Money was first seen in the Baltic under Canute the Great, and the first pieces were fabricated in England.

duced material changes in civil society. The productions of Asia became better known to and more sought after in Europe; the cities of the Mediterranean augmented their maritime and their manufactures, and gave navigation a greater degree of surety, and commerce a more regular form, by uniting for the defence of their flags, and by creating the celebrated code called the *consulado del mar*, the earliest monument of maritime legislature among the moderns.

The commercial impulse was propagated from South to North, made great progress in France, in the Low Countries, and in the south and west of Germany, from whence it was communicated to the German tribes between the Elbe and the Baltic, and in the middle of the twelfth century that sea itself began to feel the influence of the general movement. At this epoch are placed the first commercial enterprizes of the Lubeckers, the origin of a depot at Wisby, and an expedition from Bremen to Livonia. These beginnings were however feeble, and without permanent result. The rudeness of manners, the disorders and calamities resulting from the feudal system, still arrested the progress of the human mind; the routes by land were infested by bands of robbers, while piracy and depredation still continued to trouble the communications by sea, and at length made it necessary for the commercial cities of the North, in imitation of those of Italy, to unite for the protection of their enterprizes. Hence arose the celebrated Hanseatic league, whose origin is by some historians made

to

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to ascend to the year 1240, while others date it only from the middle of the fourteenth century. The total number of confederated cities was between seventy and eighty, of which those properly maritime were at first Lubeck, Hamburg, Rostock, Wismar, Greifswald, Bremen, Zutphen, Middleburg, and Campen. The association established general assemblies, imposed contributions on its members, raised troops, equipped fleets, and sent envoys to the courts of princes. Lubeck was chosen head of the league, where the assemblies met, and where the archives were preserved.

Although the internal commerce of Germany was too valuable to be neglected by the Hanse association, it chiefly occupied itself with maritime commerce, and the Baltic in particular became the great theatre of its activity. The countries washed by this sea afforded natural productions of great importance, such as timber, masts, metals, fish, cattle, honey, and furs, for which the confederated cities had to give in return woollens, linens, beer, the utensils of Germany and Flanders, and the wines and salt of France and Spain. The commerce of the Baltic was also the most advantageous to the confederation, as it could organize it at will; for with the exception of the Germans settled in Mecklenburg and Pomerania, who were amongst the founders of the league, all the other people of this sea were still ignorant of the mechanism of commerce, and hence were obliged to abandon it to strangers.

Other

Other circumstances arose to extend the influence of the league in the Baltic. When the Teutonic Knights had become sovereigns of the countries between the Vistula and the gulf of Finland, they decided that the natives should confine themselves solely to agriculture, and that Germans alone should be permitted to carry on commerce and exercise trades. In consequence of this regulation colonies of Germans fixed themselves on the coasts, with whom the confederation established relations which were favoured by the order. As these colonies acquired consistence, and received municipal governments, it was permitted them to affiliate with the league, of which the cities Elbing, Dantzick, Revel, and Riga, were admitted members, and by their rivers the products of the interior of Poland and Russia now first reached the sea, and increased the commerce of the league.

The commerce of the northern countries of the Baltic was more slowly developed, for the Scandinavians, though now separated into three distinct nations, governed each by its king, were still far behind in the progress of civilization. The regulating power had not yet acquired consistence, and the people alternately suffering under the oppression of despotism, and running into the excesses of anarchy, advanced but slowly in the industrial arts. The league taking advantage of the political situation of these countries negotiated with their kings, who wanting money and auxiliary troops, easily consented to the treaties

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proposed to them, and granted to the confederate cities, privileges and fixed commercial establishments, in return for their assistance. In consequence of these privileges, the mines of Sweden and Norway, which had hitherto been barely opened, now began to be worked with activity and intelligence, by the capital, and under the direction of the Lubeckers, who procured workmen from the mines of Bohemia and Saxony. The iron ore was conveyed to Lubeck, from whence it was distributed to the various smelting establishments and forges in Germany. The produce of the silver mines of Westmania followed the same route, and converted into money, afforded the means of augmenting the commerce of the league.

By negotiations, menaces, and promises, the league also succeeded in monopolizing the herring-fishery in the Sound, to the prejudice of the Danes themselves, whose dominions then enclosed this strait, and by the severity and vigilance with which it directed the operation, it secured to itself the entire profits. The magistrates of Lubeck, Rostock, and Wismar, repaired annually to the coast of Schonen, and superintended the fishermen with as much jealousy as if they were employed in a diamond mine.

In Bergen the league had been permitted to establish a factory, with privileges which rendered it almost independant of the sovereign of the kingdom; its members amounting to 3,000, being only accountable to the council of the Hanse.

Here

Here was formed a depot for ship timber, masts, and furs, as well as for the produce of the Northern fisheries. Elements of Commerce.

The importance of the commerce of the North depending on the relations with the west and south, the league sought every means to create these relations, and while it was consolidating its commercial dominion in the Baltic, its agents in England, France, Flanders, and Spain, were establishing correspondences to facilitate the means of exchanges with these countries. The English at this period, though advanced in agriculture and navigation, still felt the necessity of employing foreigners in their commercial industry. The league taking advantage of this necessity, got leave to establish a factory in London, with many privileges; and from hence they exported wool, which they supplied to the manufactories of Flanders and Germany, and sheep-skins, which they furnished to the people of the north for clothing and tin. Fourteenth Century.

The Flemings were in the fourteenth century much further advanced in the industrial arts, and enjoyed a much superior civil order, than any other people of the north. Their commercial cities had already introduced maritime assurances and established the system of paper exchanges, and Bruges and Gand possessed magnificent buildings, when Hamburg and Lubeck had still but wretched thatched dwellings. Bruges being most advantageously situated and possessing the port of Sluys, became, by the consent of all the trading

nations, the general entrepot of the commercial productions of all parts of the world, and for the better superintending their respective interests each nation established a factory in this city.

The commercial relations of the league with France appear to have arrived at a certain stability towards the end of the fourteenth century, for in 1397, Philip IV. granted liberty of commerce to several of the confederated cities on condition of paying certain duties. The advantages the league derived from this privilege were, however, of little moment until the middle of the fifteenth century, when France beginning to breathe from her long series of misfortunes and reverses in her wars with England, was enabled to turn her views towards the arts of peace.

Of all the confederated cities in the Baltic, Wisby in the island of Gottland, being the most central, was chosen for a general depot. Here the vessels, which from the still imperfect state of navigation could not perform their voyage in one season, wintered and lodged their cargoes in magazines on shore. Here was also composed the first maritime code of the north, founded on the *consulado del mar* and the statutes of Oleron, and which form the basis of the modern naval codes of the Danes and Swedes.

Although a considerable portion of the commerce of the north continued to be carried on by exchanges in kind until the close of the fifteenth century, money had been used as a medium from the thirteenth, and the gold and silver

coins

coins of the Arabs, introduced into Europe from the Levant, were first used for this purpose. It is also probable that the Roman coins still remaining in circulation in the south, found their way to the north: at least, this is the most satisfactory manner of accounting for these coins being occasionally found on the coasts of the Baltic. As the working of the mines of Bohemia, Hungary, and Sweden, were extended, money grew more common in the north, and Lubeck, which coined the silver of Sweden, first created a standard, or assay of coin.

Though the league had frequent ruptures with the northern crowns, either by negotiations or by arms, it maintained its commercial ascendancy in the Baltic for more than two centuries, and at last only ceded before the power of time, which producing political revolutions, and gradually enlightening the people of the north, at length freed them from the commercial subjection in which their ignorance had so long kept them.

The Dutch and the English first began to weaken the influence of the league, by seeking a participation in the commerce of the north. The principal cities of that part of the Low Countries that afterwards formed the republic of Holland, had been members of the association from its origin; but as they detached themselves from the Germanic empire by the influence of the house of Bourbon, and as they adapted more their commercial system to their particular situation, they ceased to conduct themselves by the councils of

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the league, and under their own flag, pushed their commercial enterprises into the Baltic, in defiance of the regulations of the association. This dereliction of their general principles produced hostilities on the part of Lubeck, Rostock, and Wismar. The Dutch made reprisals, and thus a schism was created, which no negotiation could heal. The league ordered its agents to admit no Dutch into its proper establishments, and to endeavour to prevent their gaining admission into the ports over which they exercised any influence. The Dutch were not, however, idle, and by negotiations with the King of Denmark and the Teutonic Order, they obtained the freedom of commerce in their respective dominions, and the vessels of Amsterdam, Rotterdam, and Dort, visited Copenhagen, Dantzick, and Riga, and the ports of Norway, except Bergen, which was rather a possession of the league than of the Norwegian monarch.

The English now also beginning to appreciate their commercial resources, sought to enjoy an active share in the commerce of their wool and woollen cloths. They succeeded in getting admission for their vessels to Denmark, Sweden, and Dantzick; and in the middle of the fifteenth century they had a treaty of commerce with Denmark and a factory at Elseneur. In 1474 they also concluded a treaty with the Hanse league, by which they were allowed to trade throughout its jurisdiction, and to establish factories in the cities of the association in Germany and Livonia. So many

many obstacles were, however, thrown in the way of the full execution of this treaty, that its results did not extend beyond some temporary concessions, which were of little importance to the general commerce of England; and it was not until more than a century after, that Elizabeth obliged the league to allow the establishment of an English factory at Hamburg.

Rise and Progress of the

The writers of the north, in general, represent the Hanse association in unfavourable colours. It was, according to them, long the scourge of the people of the Baltic, over whom it not only often exercised a political tyranny, but the progress of whose knowledge and civilization it also retarded, by its commercial monopoly. Its apologists, on the contrary, assert, and certainly with more justice, that the general effects of the commercial dominion of the league were extremely advantageous, not only to the countries of the north, but to Europe in general. In order to accomplish the views of nature, by extending the intercourse of nations, it was necessary to open the Baltic to commercial relations; it was necessary to instruct men still barbarous, in the elements of industry, and to familiarize them with the principles of civilization. These great foundations were laid by the confederation, and at the close of the fifteenth century, the Baltic and the neighbouring seas had by its means become frequented routes of communication between the north and south. The people of the former were thus enabled to follow the progress of the latter,

in knowledge and industry; their war and hither to useless forests now afforded important objects of commerce, and in their places were seen rich harvests of corn, hemp, and flax, covering the soils of Denmark, Prussia, Poland, and Livonia. In return for these objects, and for the silver, copper and iron of Sweden and Norway, were given the productions and manufactures of the south, necessary to the comfort of civilized life. The fishing hamlets of the coast, and the huts of the wandering Scandinavians, grew up into towns and villages, manners were softened, and the social intercourse consolidated and refined. The inhabitant of the north was no longer covered with the spoils of the bear and wolf, but possessed woollens, linens, cottons, and even silks; and, instead of drinking hydromel out of the skull of an enemy, he now drank beer and wine out of silver cups. Learning found asylums on the banks of the Vistula, the Mælar, and the Sound; and printing was scarcely invented, before it was introduced into Denmark, Sweden, Prussia, and Livonia.

Third period.—From the Decline of the Hanse Confederation to the end of the seventeenth Century.

At the close of the fifteenth century, a remarkable revolution in ideas began to change the general aspect of society in Europe. The feudal system began to give way before the increasing authority of the sovereigns, and the growing liberties

liberties of the people. The press diffused knowledge of all kinds, while the invention of the compass led to the discovery of a new route to India, and of a new world in the west. The impulse given by these causes propagated itself rapidly from south to north; the Hanse confederation, no longer necessary to the people of the latter, was already enfeebled in Germany and the Low Countries; the immunities of the confederate cities were attacked by the sovereigns, in whose territories they were situated. The reform of Luther gaining ground in the north, was embraced by some of the cities, and rejected by others, and hence originated troubles and discord, that destroyed that unity of views, which had hitherto been the basis of the prosperity of the association. A separation took place, and the league from this time was principally confined to the maritime cities, amongst whom Lubeck, Hamburg, Bremen, Rostock, and Dantzick, took the lead.

While internal dissensions thus broke the power of the league in Germany, it lost its privileges in Sweden. During the reigns of Christian II. and Gustavus Vasa, a commercial concurrence was established in that kingdom, between foreign nations; and the Swedes themselves were encouraged to take an active part in the national commerce, for which purpose Gustavus concluded treaties with England, Holland, and France. The same principles were adopted in Denmark, and the imperious ascendancy of the Hanse in

Bergen,

Rise and Progress of Commerce.

Bergen was reduced to a little more than a privilege of privileges with the Dutch and English.

At this same epoch, Denmark and Sweden laid the foundation of military marines, and by the assistance of foreign builders, both had soon respectable fleets, and that of Sweden, composed of twenty vessels, gained a signal victory over the Lubeckers near the island of Bornholm. Denmark having declared war against Sweden, was joined by Lubeck and some other cities of the league, who thought it a favourable occasion to recover their ascendancy in Sweden. The Swedes however, after some reverses, and the capture by the Danes of their greatest ship of war, called the Sans Pareil, which mounted 125 guns, gained several brilliant victories, and their flag floated triumphant in the Sound, when in 1570 a peace was concluded, and the system of free commerce in Sweden was maintained in all its points. The league intrigued in vain to create enemies to Sweden, and it was even obliged to use much management to escape the vengeance of the latter.

While the confederacy was thus rapidly losing its preponderancy in the Baltic, it was also deprived of its advantages in other places. The prosperity of Bruges had vanished, and Antwerp ceding before its rival Amsterdam, the Hanse factories in these two cities lost the greater part of their activity, and were, besides, exposed to considerable losses and many vexations from the Dutch; on the other side, England having extended

pended her views, the affairs of the Hanse were there also circumscribed, and in the reign of Elizabeth a serious dispute having arisen between the members of the Hanse factory in London and the citizens, the queen was only appeased by the concession of a factory at Hamburg. The relations of the league with France, Spain, and Italy, lengthened out its existence, but were insufficient to compensate to many other losses, and no favourable circumstance had presented itself to retrieve its affairs, when the thirty years war began in Germany. Rise and Progress of Commerce. A. D. 1618.

At the commencement of this war, the Austrian armies entered Mecklenburg and Pomerania; hence towns, without regard to their privileges, were summoned to open their gates to the troops of the head of the empire, and Wismar and Griefswald, two of the Hanse confederation, received garrisons. The victories of Gustavus Adolphus, who was chosen head of the Protestant confederacy, restored the German Hanse towns their independency; but the conqueror, though he received the deputies of the league in a distinguished manner, could not be prevailed on to renew their ancient privileges in Sweden, and after his death, A. D. 1632. the calamities of war again visited the Hanse cities as well as the rest of Germany. At the same time, the league saw Christian IV. of Denmark taking the most decisive measures to shake off all dependance on it, and its ancient allies, the cities of Prussia, Courland, and Livonia, finally subjected to

to the house of Brandenburg, to Poland, and to Sweden.

When at the peace of Westphalia the German states received a new political organization, the league in vain sought to attach itself to the empire, as an independant member; the emperor foreseeing no event in which it could be useful to him, abandoned it to its fate, and while it was fluctuating between hope and fear, England and Holland possessed themselves of its commerce. Lubeck convoked general assemblies, but in which no resolutions were taken for the general interest, and towards the middle of the seventeenth century, the confederation was reduced to the cities of Lubeck, Hamburg, and Bremen, to whom Dantzic sometimes acceded. These cities, profiting by the independance they still retained, separately pursued the enterprises that their respective situations and means indicated, and only treated in common in some political circumstances, which necessitated particular measures, or required greater maturity of counsels.

Encouraged by their princes, seconded by their progress in several branches of national industry, and carried forward by the general movement which reigned in Europe, the people of the Baltic felt the importance of maritime commerce, and the merchant flags of Denmark and Sweden appeared in most of the ports of Europe. Nevertheless, the intervention of foreigners in the commerce of these countries was still necessary, either to

Rise and Progress of Commerce.

give birth to useful enactments, or to supply the deficiency of national capitals. After the fall of the Hanse league, the Dutch engrossed the principal part of the commerce of the world. At the beginning of the seventeenth century, they had already extended their commercial enterprises to the two Indies, and their marine was the most active of Europe. By the cheapness with which they sailed their ships, and by the low interest of money in Holland, they were enabled to supply to the countries of the north the objects necessary to them, at a more moderate rate than any other trading nation, and for the same reasons they could make more advantage of the productions of the north. Moreover, this saving people had already a considerable disposable capital, which enabled them to render essential services to the states of the Baltic. They lent large sums to Prussia, Denmark, and Sweden, which by accelerating the progress of agriculture and other arts, augmented their productions to their reciprocal advantage. These kind of advances continued until very lately, and twenty years since, a house at Amsterdam was deeply interested in working the mines of Sweden and Finland.

But, while the Dutch spread over the world their vessels and their factors, they encountered in the track of their commerce a people equally enterprising and prudent, equally brave and intelligent as themselves, and who determined to share with them the commerce and the dominion of the ocean. England, at the middle of the seventeenth century,

Rise and Progress of Commerce.

century, had greatly increased her merchant marine, and her naval victories over the Dutch secured to her flag a preponderancy in the seas of Europe. With these advantages, the Baltic could not escape the attention of her merchants, and the wish of the sovereigns of the north to establish an advantageous concurrence, afforded them the means of extending their communications with these countries. From the middle of the sixteenth century, the English had relations with the Baltic, and were well received in the ports of Prussia and Livonia, and during the reign of Eric XIV., who long hoped to espouse Elizabeth, they founded a kind of colony at Stockholm with extensive privileges. At the same period, the discovery of Archangel afforded them an opportunity of extending their relations with the north of Europe, and sharing through another channel a part of its commerce, which other nations disputed with them in the Baltic; and this share was greatly augmented, when the Russians, in the beginning of the seventeenth century, were entirely excluded from this sea.

The importance of the productions of the north increasing in the proportion that the foreign powers increased their naval establishments, the commerce of the Baltic received a great extension during the seventeenth century. An improved system of agriculture augmented the products of the countries on the south of this sea; and hemp and flax, in particular, became most important objects of export. The forests were cut with more regularity

regularity and intelligence, and not only furnished timber and masts, but also pitch, tar, and potash; while the Swedes, having learned to reduce their iron ore into metal, greatly extended the working of their mines. From the Baltic, England and France filled their marine arsenals with naval stores; and the Dutch formed immense depots of these objects at Rotterdam, Amsterdam, and Saardam, as well for their own use, as to supply them to the people of the south. Increase of commerce.

The increase of importations kept way with that of exports; for the northern nations now began to acquire a taste for the luxuries of life, as well as its comforts, and their wants multiplied with the extension of the sphere of their activity. The use of wine, spices, fine woollens, cottons, and silks, became general; and to these were soon added sweet oil, fruits, tobacco, coffee, sugar, and expensive furniture. Towards the middle of the seventeenth century, 2,000 vessels passed the Sound annually. Whatever tended to the organization of a commercial police, and to the security of navigation, was improved; light-houses and beacons were multiplied, corps of pilots were formed, and tribunals of commerce, banks, and exchanges, were established in the principal cities of the Baltic.

The grand commercial movement was now principally directed by Denmark and Sweden; and according to political circumstances, the preponderating influence of these powers augmented or diminished the activity of the trading nations. Christian IV., who reigned in Denmark for half

Rise and Progress of Commerce.

half a century, accelerated the commercial progress of that nation, and raised it to a height at once glorious and profitable. He improved and fortified several ports; founded a navigation school at Copenhagen; was himself capable of commanding his fleets, and in 1699, sailed with ten large ships to double the North Cape, and examine the coast of Lapland to the White Sea. He also sent vessels to Iceland and Greenland to re-animate commerce and to form seamen.* He even turned his views towards India, where one of his admirals acquired the territory of Tranquebar; and, in 1618, he established an East-India Company, which still exists.

Towards the end of his reign Christian had a disagreement with the Dutch and Swedes respecting the duty of the Sound, which was the principal cause of a war that ended unfavourably for Denmark. The origin of this duty remounts to the beginning of the middle age, when it was established by the princes of Denmark, for the support of light-houses, and the protection of navigation from the pirates of the Baltic. While the Hanse association monopolized the commerce of this sea, the duties were easily regulated; but they became complicated in proportion as the navigation was extended, and as foreigners began to share in it. In order to secure their payment, Frederick II. caused Cronborg to be built, and

* In 1611 he sent two fleets to sea, one of seventeen, and the other of eleven vessels; several mounting from seventy to fifty guns.

and established a fixed tarif. Christian IV. in want of money, which the states denied him, raised the duties considerably, so that they amounted to two and a half per cent. of the value of the merchandise; and the Dutch alone paid more than 600,000 crowns annually. Christian also assumed another onerous right, that of purchasing at his pleasure all cargoes that passed the Sound, for the price at which the captains had valued them in their declarations. The war in which these arbitrary exactions involved Denmark with the Dutch and the Swedes, whose vessels were also obliged to pay the duty of the Sound, though of right exempt from it by ancient treaties, terminated in 1645, by Denmark ceding to Sweden the Islands of Œsel and Gottland, and some districts in Norway, in perpetuity, and the province of Halland for thirty years. The Swedish vessels were declared exempt from the duty of the Sound, and the Dutch were allowed to commute it for 250,000 crowns per annum.*

Rise and Progress of Commerce.

From the reign of Eric XIV. Sweden had gradually extended her influence in the Baltic. Charles IX. subdued a great part of Estonia and Livonia, raised towns in Finland, and founded Gothenburg; his successor, Gustavus Adolphus, extended the limits of the Swedish dominion on the east, encouraged foreign citizens to settle in the kingdom,

* Under the immediate successors of Christian, the Danish navy was totally neglected; and when, by the peace of Roskild, in 1658, Denmark agreed to deliver up to Sweden twelve sail of the line, the latter found the vessels in so bad a state that they did not think it worth their while to take them away.

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rebuilt Gothenburg, which had been burned by the Danes, and founded several towns in the Gulf of Bothnia. The same prince also established a company to trade to Asia, Africa, and America; of which, though it had but a short existence, one result is worthy of notice.—Under its auspices many Swedish and Finland families emigrated to America and formed a colony at the mouth of the Delaware; and which, though it has successively fallen under the dominion of the Dutch, English, and Anglo-Americans, still continues to receive from Sweden the chief of its church. The Swedes also in the reign of Gustavus Adolphus formed establishments on the coast of Guinea, at Cape Corse, Anamaboo, and Johannisborg; of which, however, they were soon dispossessed by the Danes.

1627.

Charles X. or Charles Gustavus, increased and protected the commerce of his dominions. In his reign treaties were concluded with several of the maritime powers, a council of commerce was created, and the police of the ports new organized. By his victories he confirmed to Sweden the possession of Estonia and Livonia, and obliged the Danes to cede the provinces of Halland, Schonen, and Blekingen.

The reign of Charles XI. was chiefly marked by measures of utility, by which industry and commerce were perfected and increased, particularly by the improvement of the roads and the formation of canals. This prince also encouraged the building of merchant vessels, increased the navy to thirty sail of the line, and removed its chief station from

from Stockholm, which has many inconveniences, to Carlscrona, which possesses great natural advantages, and which he improved by art. Rise and Progress of Commerce.

Master of the coast on which some of the greatest rivers of Russia empty themselves, the same prince projected a communication between the Baltic and Caspian Sea by these rivers. For this purpose he sent an embassy to Ispahan, which was well received by the Persian Court; but the results of this attempt could not be considerable, for the merchandise of India found its way to Europe with much more certainty, and at less expense, by the Cape of Good Hope: hence, after a few trials, which proved little profitable, this object was abandoned.

While the sovereigns of Denmark and Sweden sometimes divided and sometimes disputed the dominion of the Baltic, a prince, whose means were not so extensive, but whose genius compensated the smallness of his resources, displayed in the same sea an important influence. This was Frederick William of Brandenburg, surnamed the Great Elector. A part of Pomerania had devolved to this prince, and he had created Prussia into an independent state. Acquainted with maritime affairs by his residence in Holland, he sought to act a part among the naval powers, and in 1676, being at war with Sweden, he caused foreigners to equip in his ports three frigates and six lesser vessels, which annoyed the trade of Sweden and even captured one of her frigates.

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The following year the siege of Dantzick was supported by six Prussian frigates, and in 1678 ten frigates blockaded Stralsund. Spain not having acquitted a subsidy promised to the Elector in the war with France, in 1680 he equipped six frigates, of from twenty to forty guns each, to cruise against the Spanish trade in the ocean. This squadron visited the coasts of England and France, and even America, captured a Spanish ship of sixty guns, and supported an engagement with twelve armed ships of that nation. Under this great prince the ports of Prussia received an organization, that raised their commerce to a flourishing height, and those of Memel, Elbing, Konigsberg, and Pillau were deepened and provided with pilots.

Having thus rapidly, but we trust perspicuously, traced the gradual development of the commerce and maritime power of the people of the North, from the earliest period to the close of the seventeenth century, we now arrive at an epoch when new relations, resulting from the political and moral state of Europe, gave to the commerce of the Baltic an extraordinary extension and activity. The frequent maritime wars since the commencement of the eighteenth century, increased the value of the productions of the North, while the people of these countries, familiarized more and more with the enjoyments of luxury, sought with more avidity the productions of the South. Besides, from the commencement of this century, the vast territories of Russia have communicated immediately

with

with the Baltic, and thereby immensely augmented the commerce of this sea. Rise and Progress of Commerce.

Fourth Period.—Commerce and Maritime Affairs of the Baltic from the beginning of the Eighteenth Century.

At the commencement of the eighteenth century, the commerce of Denmark had arrived at a respectable consistence and extension, and the Danish merchant flag was seen not only in the seas of Europe, but also in those of Africa and the two Indies, employed in conveying the produce of her colonies to the metropolis. The active part that Frederick IV. took in the war which for twenty years desolated the North, not only prevented the increase of the commerce of his dominions, but often greatly reduced it. At length the death of Charles XII. and the interference of England restored peace to the North, which the Swedes purchased by renouncing their exemption from the duties of the Sound. From this epoch until the beginning of the present century, Denmark (with a few trifling interruptions) has enjoyed a profound peace. The commercial administration during the first part of this long calm, was however by no means favourable to its increase, for though the colonial possessions were extended in Africa, Asia, and the West Indies, the relations of the metropolis with them, as well as with Finmark, Iceland, the Ferroe Islands, and Denmark.

Commerce. Denmark.

Greenland, were shackled with the chains of exclusive companies. The reformation that Frederick IV. wished to introduce in the condition of the labouring class, was not followed up, and the sums destined for the improvement and establishment of manufactures, not being employed with intelligence, produced no important results. In 1746, Frederick V. mounted the throne, and a brighter era of commerce commenced.—This prince gave his confidence to Count Ernest Von Bernstoff, who knew and pursued the true interests of the nation. Under his administration the industrial arts were perfected, and commerce protected and encouraged; feeling that, "wanting liberty, even virtue mourns, and looks round for happiness in vain," he granted freedom to all his own peasants, watched over their moral instruction, and afforded them the means of bettering their condition. Nor were his vassals ungrateful: they erected a monument to their liberator, on one side of the great road to Copenhagen, which, though simple, calls forth the respect and veneration of the friend of humanity, infinitely more than the triumphal arches and columns raised to the destroyers of mankind.

During the Seven Years' War, Count Bernstoff concluded a treaty of commercial neutrality with Sweden, which threw a great portion of the trade of the Baltic into the hands of the Danes, and the same minister negotiated the exchange of the Dutchies of Oldenburg and Holstein, equally advantageous to Denmark, in a political and commercial

mercial point of view, by the concentration of her dominions, and by the removal of the obstacles to the construction of the canal of Holstein. Commerce. Denmark.

During the reign of Christian VII. Andrew Von Bernstoff, nephew of Ernest, and worthy of the relationship, directed the reins of government, and was supported by the Prince Regent, the present King. The nephew following the plans of the uncle, the peasants were gradually made free, the commercial monopolies disappeared by degrees, and a new system of finance regenerated the public credit. In 1780, Denmark acceded to the armed neutrality proposed by the Empress of Russia, the object of which was to support the right of neutral vessels to convey the property of belligerents. During the war of the French revolution, the Danish government rejected every solicitation to join the coalition against France, declaring its intention to maintain the strictest neutrality, but under the veil of which it permitted its flag to cover, and carry on the whole trade of the enemies of England. In 1801, Denmark went a step farther, and joined the second convention of neutrality of the North, which was in fact a confederacy against the naval superiority of Great Britain. This league was, however, quickly dissolved, by the appearance of a British fleet in the Baltic, a detachment of which, under the great Nelson, forced the line of defence formed by the Danish fleet before Copenhagen, and compelled the Danes to a cessation of arms to save their capital. In this short war the Danish settle-

Commerce. Denmark.

ments, in the East and West Indies, were captured by the English; but the dispute being soon after settled, by Denmark abandoning the coalition, these possessions were restored.

In 1807, the political situation of Denmark throwing her entirely into the power of France, Great Britain found it necessary to have recourse to the strongest means, to prevent the Danish navy from being employed against her; and accordingly a large fleet and land force were sent into the Baltic, and appeared before Copenhagen in the beginning of August. An amicable proposition was first made to the Prince Royal to enter into an alliance offensive and defensive with England, and to give up the Danish fleet, to be retained *en dépôt*, to prevent its falling into the hands of the French. These proposals being rejected, a proclamation was issued by the English commanders, stating, that the influence given to France, by the late treaties of peace with the northern powers, was the sole motive that induced the king of England to secure the Danish fleet, it being no longer possible for Denmark to remain neutral. Hostilities immediately followed this proclamation, and on the 7th of September, after a bombardment of several days and nights, Copenhagen capitulated, the Danish fleet was surrendered, and conveyed to England, loaded with the naval stores found in the arsenals of the capital.

The capture of all the Danish colonies by the English succeeded to this blow, and the commerce

merce and marine of Denmark were thus totally annihilated. Commerce. Denmark.

Though the commerce of Denmark must suffer a great reduction by the loss of Norway, nevertheless the natural productions of her remaining dominions are still sufficient to aliment a respectable trade. Denmark and the dutchies afford wheat, rye, oats, barley, rape-seed, horses and horned cattle, fish, chalk, porcelain, and wooden domestic utensils, which are exchanged for fine woollens, silks and cottons, hardware, cutlery and paper, salt, coals, iron, hemp, flax, oak timber, tobacco, rice, wines, oils, fruits, and colonial produce, &c. A considerable portion of these imports are, however, re-exported.

Previous to 1797, the foreign trade of Denmark was shackled by numerous restraints on importation. It was then permitted to import all foreign merchandize in Danish bottoms, the following only excepted:—

Sugar from the countries of Europe, because the sugars of St. Croix can only be exported to Denmark.

Porcelain, except from China, by the East India Company, in order to encourage the manufactory of Copenhagen; and stained or painted earthenware, for the same reason.

Playing-cards, because the stamp duty paid by those fabricated in the country is applied to the support of hospitals.

Burnt coffee, in order to avoid falsification.

Painted

Commerce. Denmark.

Painted cottons, and some kinds of woollens, to encourage the national manufactures.

All the productions of the Danish dominions may be exported. Foreign imports, re-exported, pay only one per cent. transit duty.

Foreign nations, with respect to commerce, are distinguished into privileged and non-privileged, according to specific treaties; the former pay only the same duties as the inhabitants of Denmark proper; the latter, one-third more.

Denmark and the dutchies have direct and active commercial relations with all the maritime nations, both for the exchange of their own productions and those of the East and West Indies, as well as by the commerce of transit and carrying trade.

The Danish vessels visit the ports of Mecklenburg and Pomerania, with horses, bullocks, butter, cheese, fish and fish oil, colonial produce, and other objects, and receive in return thread, linen, brandy, wines, wool, hardware, paper, and books.

To Russia and Prussia, and principally to Petersburg, Riga, and Memel, the Danes send herrings and dried fish of Norway, Iceland, and Feroe, woollen manufactures, salt of France, Spain, and Portugal, India and China goods, oysters, and dog-skin gloves; for which they receive pot-ash, planks, fire-wood, flax and hemp, cordage, iron, copper, linens and corn: the latter principally for the consumption of Norway.

To

To Holland, Denmark exports a considerable quantity of rape-seed, salted and dried fish, and timber of Norway, and receives spices, drugs, corn, pipes, and paper: the balance is considerably in favour of Denmark. Commerce. Denmark.

The commerce between Denmark and the dutchies, and England, is of no great consideration; but the deficiency was formerly compensated by the salt-fish and great quantity of wood which the English took from Norway, and for which they gave coals and manufactured goods. The balance was in favour of Denmark.

France receives from Denmark, horses, butter, cheese, fish, Norway timber, and a part of several of the objects imported from Russia; and gives in return, salt, wines, fruits, brandy, woollen and silk manufactures, and paper.

To Spain and Portugal Denmark sends the same articles as to France, and receives wool, salt, wine, and American produce.

The Danish commerce in the Mediterranean (including the ports of France and Spain on that sea), occupied upwards of 100 vessels annually. In 1798 there sailed for this destination

From Denmark and the dutchies	31 vessels
From Norway	92
From Iceland	3
	126 vess. burthen 7,257 lasts.

The cargoes consisted of wood and fish of Norway, salt provisions and butter of Holstein, and Norway and Swedish iron. In the same year fifty-five

Commerce. Denmark.

fifty-five vessels entered from the same sea, with wines, brandy, fruit, oils, and salt. The direct exchanges between the Danish dominions and the Mediterranean, however, form the smallest part of the profits of the Danes in this sea. They gain more by the freight of their vessels, both in peace and war: in the former, they are preferred by the Italians, because the Danish flag is respected by the Barbary states; for which, however, Denmark pays a considerable sum annually, under the name of presents. In war, the Danish flag covers and carries on almost the whole trade of the enemies of England; and hence, it is not surprising that Denmark should be the most strenuous supporter of the doctrine, that free ships make free goods.

The documents within our reach, from whence to deduce a general statement of the commerce of the Danish dominions, afford the following results. In 1780,

	Exports.	*Imports.*
	Rix-dollars.	Rix-dollars.
Zealand	335,000	1,098,000
Funen	24,170	45,300
Jutland	307,200	209,000
Sleswick	487,800	465,800
Holstein	198,400	158,400
Norway	1,714,369	1,238,300
	2,066,939	3,214,800

In 1801, the total exports had increased to upwards of eight millions.

The

The inhabitants of the Ferroe islands, until the middle of the sixteenth century, carried on their commerce in their own vessels, when being unable to protect it from the depredations of pirates, they gave it up to a company of merchants of Hamburg, Lubeck, and Bremen, who enjoyed it till 1607, when the King of Denmark granted it to the merchants of Bergen, and afterwards to the Iceland Company. Frederick III. granted the islands as a fief to one of his favourites, with permission to farm the commerce to the highest bidder. In 1706 the islands reverted to the crown, and their commerce has since been carried on on its account, although in 1788 it was in contemplation to declare it free, but this intention has not yet been carried into execution. Commerce. Denmark. Ferroe Islands.

The exports of these islands are dried and salted fish, fish oil, feathers, hides, tallow, and worsted stockings, to the amount of 22,500 rix-dollars per annum; the imports, consisting of wheat, flour, brandy, tea, coffee, sugar, spices, linnens, glass, &c. amount to about the same sum (average between 1781 and 1789).

According to the annals of Iceland, its inhabitants carried on a considerable trade in their own vessels in the twelfth century; but the political troubles which succeeded in the thirteenth, and other misfortunes, reduced their commerce to a very low ebb, and the little that remained fell entirely into the hands of the Hanse league, which enjoyed it till 1602, when it was given to an exclusive company at Copenhagen. Until 1684, this Iceland.

Commerce. Denmark. Colonies. Iceland.

this company monopolized the whole trade, but in that year each port was given to a separate society of merchants, and their concurrence was advantageous to the Icelanders. In 1733 a new general exclusive company was created, from which the inhabitants suffered every kind of vexation. In 1758 it was dissolved and the king took the trade into his own hands; but in 1763 another privileged company received it, whose administration was so vicious, that the king purchased the shares and again carried on the trade, but to a considerable loss, while the Icelanders received no real benefit. The terrible calamities of 1783 caused the government to consider of the best means of relieving the subsequent distress of the island, and in 1787 its trade was made free to all the subjects of Denmark, at the same time that strangers were excluded. Six of the antient ports, of which there are twenty-five, were also now raised to the rank of cities; fairs were established, and a royal packet kept up a stated communication with Denmark. The Icelanders, however, were not content with these concessions, and petitioned to be allowed a free trade with foreigners, which was, however, refused. The trade of Iceland, previous to the war, occupied about fifty vessels, chiefly galliots, of 100 to 250 tons. The exports are salted and dried fish, whale and seal oil, salted beef, hides and tallow, wool, feathers and eider down, sulphur, knit worsted stockings, gloves, &c. The imports are flour, oatmeal, beer, brandy, wine, coffee, tea, sugar,

sugar, spices, salt and manufactured goods for clothing, iron and tin ware, hardware and soap. Between 1767 and 1784 the exports averaged annually upwards of 200,000 rix-dollars, and the imports upwards of 100,000; between 1787 and 1791 the movement of commerce was as follows. Commerce. Denmark. Colothies. Iceland.

	From Copenhagen.		From Altona and Glückstadt.	
Years.	Vessels.	Lasts.	Vessels.	Lasts.
1787....	35....	1,627.....	6....	234
1788....	27....	1,042.....	28....	959
1789....	32....	1,200.....	33.,	1,390
1790....	38....	1,500.....	27....	967
1791....	35....	1,344.....	25....	945

The whale fishery alone caused any communication between Denmark and Greenland, until 1620, when Christian IV. established a Greenland company at Copenhagen, which obliged itself to send thither two ships annually to trade with the natives, as well as to take whales; but not complying with this agreement, it was suppressed in 1624. In 1636 another company received the exclusive privilege, and the first vessels it sent out returned with cargoes of glittering sand, supposed to contain gold, but which vanished on examination, and the company was immediately dissolved. Religious zeal having carried the Norwegian Egede to Greenland in 1720, this desolate country once more became the object of commercial speculation, and a company was formed, which being unsuccessful, a private merchant, named Severin, solicited and obtained its privileges, and hazarded several expeditions, which Greenland.

produced

Commerce.

Denmark. Colonies. Greenland.

produced considerable profits. In 1750 he resigned his charter to a company, who undertook to combine the trade and whale fishery, but which in its turn relinquished the attempt, and government, until 1788, took both these speculations into its own hands, but with such a loss, that in that year the crown also relinquished the business, which was again taken up by a company.

The objects which Greenland affords for commerce are whale oil and bone, seal oil and skins, dried and salted fish, furs, feathers, and eider down. The imports are flour for the colonists, woollens, tobacco, brandy, sugar, spices, &c. Between 1780 and 1787, the annual extent of the commerce of Greenland was as follows.

EXPORTS.

Years.	Of objects drawn from Greenland.	Of the Whale Fishery.	Total.	IMPORTS.
	Rix-Dollars.	*Rix-Dollars.*	*Rix-Dollars.*	*Rix-Dollars.*
1781....	41,396.....	81,197..	122,593..	35,989
1782....	71,796.....	35,456..	107,428..	43,645
1783....	74,986.....	48,476..	123,462..	64,903
1784...	111,616.....	15,471..	127,087..	74,114
1785....	99,851.....	51,638..	151,495..	81,866
1786....	95,813.....	70,102..	165,915..	80,499
1787....	93,110.....	75,365..	168,475..	74,427

West Coast of Africa.

Denmark claims a territory on the coast of Guinea, of fifty miles of coast, from the river Volta to the east,* and has several forts and factories

* This tract was originally claimed by the Portuguese, who ceded it to the Swedes, and these latter to the Danes.

tories on this coast. The trade was successively vested in companies and made free until 1791, when it was finally thrown open to all the subjects of Denmark; at the same time that the slave trade, on the report of a commission of examination, was ordered to cease in 1803. The number of slaves taken from the coast in Danish vessels varied from 500 to 2,500, annually; and the Danish establishments supplied from 300 to 1,000 to foreign vessels. The African establishments are supported by government at the expense of 90,000 rix-dollars per annum, and the revenues they afford do not cover this expense. (For further details see vol. ii. West coast of Africa.) Commerce. Denmark. Colonies.

In 1671 the Danes first turned their views to the West-Indies, and took possession of the uninhabited island of St. Thomas. In 1719 they colonized St. John's, and in 1735 purchased St. Croix from France; when a company was established at Copenhagen to trade to these islands and to the coast of Africa, but the abuses in its administration caused it to be suppressed in 1754, and the trade was declared open to all the subjects of Denmark proper, Sleswick, and Norway; but with restrictions which changed from time to time until 1777, when the importation was confined to Copenhagen, and in the following year an exclusive company was again established. St. Thomas being made a free port, the company's affairs were so flourishing, that the shares rose to double West-Indies.

Danish West India Islands.

doubls their nominal value. This brilliant success was, however, but of short duration; the speculations carried to too vast an extent were attended by great losses, and the peace of 1783, by putting an end to the advantages of neutrality, reduced the trade under the Danish flag to a cypher. In 1785 the company's charter expired, and the trade received a new organization. All the ports of Denmark, of the dutchies, and of Norway, may send vessels to St. Croix, but their returns are to be to Copenhagen, or to the cities that have sugar refineries. Altona is, however, excepted from this last privilege, in consequence of others that she enjoys. The trade to St. Thomas and St. John's, is free from all restraint with respect to Danish subjects, and even strangers are allowed to visit these islands under certain regulations. The Danes enjoy, in common with the English and Spaniards, the right of cutting wood on, and fishing near the Isle of Crabs.

The productions of the Danish West India islands form but a small portion of their exports, the greater part being the produce of the neighbouring islands and of the Spanish possessions on the continent. The Danish islands produce annually 21,000 hogsheads of sugar, 9,150 hogsheads of rum, and about 220,000 pounds of cotton. The objects received and re-exported as above are indigo, cocoa, tobacco, mahogany, &c. Denmark and her dominions consume about one half the imports of colonial produce, and the other half is exported to the neighbouring countries.

The

The vessels employed in the West-India trade are from forty to sixty lasts. The extent of this trade fluctuates very greatly, according to the circumstances of peace or war between the maritime powers, as the following statement proves. The West-India trade employed vessels under Danish colours, in

1754	7	The war between England and France from
1761	62	1756 to 1763 produced this increase.
1781	127	The same effect was produced by the Ameri-
1782	146	can war.
1783	91	The peace caused this reduction.
1793	55	
1797	86	The war between England and France caused
1798	76	this increase.

The Danes first appeared in the Indian seas in 1616, when a company was established at Copenhagen and an establishment formed at Tranquebar. In 1634 the company resigned its privileges to the crown, but the troubles of the kingdom under the reign of Frederick III. caused the India trade to be almost entirely abandoned; it was however renewed when tranquillity was restored, and a company being again erected in 1674, it sent the first ships to China. The trade continued to be carried on by successive companies until 1772, when, at the expiration of the charter, the trade to India was made free to all the subjects of Denmark, on payment of four per cent. of the returns to the company, to whom also was continued the exclusive trade to China. In 1777 the crown pur-

East-Indies.

Commerce. Denmark. Colonies. East-Indies.

chased the company's establishments in India, and made the trade entirely free, the company still however retaining the exclusive China trade. Its charter expired in 1792, and was renewed for twenty years. It was at this time permitted to Danish subjects to freight vessels for India in foreign ports, on condition of procuring passports at Copenhagen, Tranquebar, or Serampore, and landing the return cargoes at Copenhagen, to be sold by public auction. Foreigners may also import in their own vessels into Copenhagen the produce of India, but not of China.

The capital of the company is 2,400,000 rix-dollars, in shares of 500. From 1780 to 1790 it sent twenty-nine ships to China, whose returns exceeded three millions of rix-dollars, and the cargoes from India produced nearly an equal sum; of these six millions about the half was clear profit, and the dividend was forty-eight rix-dollars a share per annum, or nearly ten per cent. The extent of the Danish India trade may be estimated from the following statement:

Years.	Number of return cargoes.	Value. *Rix-dollars.*
1773 to 1777	28	8 millions
1778 .. 1782	78	23
1783 .. 1786	102	28
1805	25	

The company send about three ships a year to China, and twelve to India, the remainder are the speculations of individuals. The establishments of the Danes in India are, the fort of Tranquebar

on

on the Coromandel Coast; factories at Serampore on the Hughly; at Balasore and Patna in Bengal; at Porto Novo, Callicut, and College on the Malabar coast; and at Canton. Denmark also claims the Nicobar Islands in the Bay of Bengal, and keeps the Danish flag flying on them in support of this claim. Commerce. Denmark. Colonies. East-Indies.

The Danish dominions have several naval and maritime commercial establishments. At Copenhagen is a depot of charts, and a school of naval cadets; the latter was founded in 1701: fifty scholars are educated gratis, and the others pay a fixed stipend. They make two annual cruises in the Baltic of six weeks each, and after joining a ship may attend gratis the public lectures on hydraulics, hydrostatics, and navigation. At Copenhagen is a royal naval hospital, and at Elseneur one for the reception of merchant seamen of all nations. Marine Institutions.

Corps of authorized pilots are established on the coasts, and light-houses have been multiplied. The expenses of these institutions are defrayed by the duties of the Sound and Belts, the amount of which varies, of course, with the revolutions of commerce.

	Number of vessels passed the Sound.	Receipt of duties. Rix-dollars.
In 1770	7,736	469,890
1799	7,848	681,079

Denmark. Marine Institutions.

Since 1727 Copenhagen has had a maritime assurance company, whose capital is 600,000 rix-dollars, in shares of 1,000. In 1797 the amount of property insured was six millions of rix-dollars nearly, of which the premium was upwards of 270,000, and the payments 300,000. In the same year the dividend was fixed at forty rix-dollars the share.

Most of the Danish merchant vessels are Danish built, those purchased from foreigners being obliged to pay a duty of ten per cent. to be admitted as national bottoms.

State of the Danish Merchant Marine at different Periods.

	No. of Vessels.	Tonnage.	Seamen.
1746 ..	1,200 to 1,500 ..	—	
1792	3,113	85,336	
1799	2,183	124,129	18,000
1800	2,200	—	
1806	2,529	136,166	
1810	1,972	100,938	

Fisheries.

Though the produce of the Danish fisheries in the Baltic and British ocean has decreased within the last century, they are still an important object of national industry, and might be made much more so if their police was better regulated, and encouragement given to employ a greater capital. Near the Scaw is a considerable fishery of flat fish, the produce of which is principally salted or smoked for exportation. In 1781 and 1782 the

town of Skagen exported upwards of 600,000 fish thus cured. The Gulf of Limfiord has a very productive fishery of herrings and eels; those of Ringkiöbing and Randers are no less important, and the latter in particular has a rich salmon fishery in the river Guden.

In the Gulfs of Flensburg and Slie a quantity of small herrings make their appearance from March to May, and a few in autumn; besides what is consumed fresh, 1,000 tons salted are exported annually to Copenhagen and Germany. The fishery in the Gulf of Slie is the property of the nobles whose lands border the gulf, and of the citizens of Sleswick, but is usually rented to the fishermen of the village of Cappel. The porpoise fishery at Middelfart is very little profitable. The Sound and Belts afford mackarel and whiting for immediate consumption.

The fisheries on the western coast of Jutland occupy all the peasants of the coast; the fish taken are salmon, cod, and flat fish. On this coast and on that of Sleswick are productive oyster-banks: those on the latter are let by the crown for 75,000 rix-dollars, and their produce supplies the Baltic and north of Germany. A considerable herring fishery is carried on at the mouth of the Elbe, and chiefly from the village of Blakenzie, the produce of which, valued at 100,000 rix-dollars, is sent to Altona, Hamburg, and Holland.

In 1767 a company was established at Altona to carry on the herring fishery in the British Seas; but before the privilege, which was for ten years,

Fisheries. had expired, the crown purchased the rights, and this fishery has been since carried on on its account. Its produce is about 6,000 tons, and is sent chiefly to Hamburg and Petersburg. The inhabitants of Heligoland take large quantities of the small cod, called scholl-fish, near the island, and send them fresh to Hamburg, Stade, and Bremen; these islanders also employ a considerable capital in the lobster fishery.

Previous to the separation of Norway, the whole of the Danish fisheries brought into the country one million and a half of rix-dollars per annum, of which one million was for Norway.

Marine. During the greater part of the eighteenth century the Danish navy was respectable, but the beginning of the nineteenth has seen it totally annihilated, by the adherence of Denmark to the system of France. In 1801 the fleet consisted of

22 ships of the line, from 80 to 60 guns
10 frigates, from ..... 40 to 24
9 sloops, from ..... 20 to 16
3 praems, of 20
13 gun-vessels, of 4

Besides seven old ships of the line, fitted as block-ships, before Copenhagen. Of this force, one ship of seventy-four guns, and five of the block-ships, were destroyed, and a ship of sixty-four guns taken, by Nelson in 1801.

1	96	26 of the line
2	84	
13	74	
4	64	
6	44	16 frigates.
2	36	
8	28	
2	24	
3	20	
9	20 to 14—9 sloops.	
30	gun-vessels, 4.	

There were surrendered to Nelson in the same year:

16 sail of the line,
14 frigates,
8 sloops,
26 gun-vessels.
2 sail of the line and some small vessels destroyed.

For the materials of construction and equipment of the fleet, except iron, copper, and masts, and pitch and tar, which Norway affords, Denmark is dependant on foreigners. The oak timber is procured from Pomerania, the hemp from Russia, and the sail-cloth from Russia and Holland.

In 1782 the expense of building and rigging a ship of seventy guns, was 186,000 rix-dollars; a sixty-gun ship, 159,000; and a thirty-six gun frigate 76,000.

Until the reign of Frederick IV. the seamen for the

Denmark. Marine.

the fleet were procured by voluntary enlistment, both in the Danish dominions and in the free maritime cities of the north. That prince introduced the system of register. The coasts are divided into maritime districts, and all their inhabitants who follow the fisheries, or other sea faring lines, are registered in two classes, ordinary and extraordinary. When men are required for the fleet, they are taken from the ordinary class, in such a manner that the first selection falls on those who have no families or infirm parents to support.

Registered seamen alone can be employed on board the national merchant vessels, and in this case they are obliged to give notice to the proper officer of the district; those inhabiting towns may even serve on board foreign vessels, on entering into an engagement to return in two years, or forfeit twenty rix-dollars, which they deposit. Every commander of a Danish trading vessel is obliged to deliver a list of his crew to the custom-house previous to his sailing, and another on his return, and to account for any difference. A registered seaman remaining in a foreign country, with an intention to settle there, is considered a deserter. After the age of fifty the registered seamen pass from the ordinary to the extraordinary class.

The registered seamen enjoy several privileges and immunities, even when not employed. Their pay commences from the moment of their being put in requisition, and increases with the activity of service. Their sea-pay varies from two rix-dollars to five per month, and they have a share of prizes.

prizes. The total number registered is 30,000; of which 2,000 are kept in constant employment, in peace or war, for the port service. They are lodged in barracks at Copenhagen, receive an annual pay of twenty rix-dollars, their provisions, and a suit of clothes every two years. Denmark. Marine.

There is besides another permanent corps of 1,190 or 1,200 artificers, who are on the same footing as the permanent seamen; but when they are actually employed they receive a daily pay of from eight to twenty schellings in summer, and from six to fourteen in winter. The provisions supplied to the two permanent corps are meat, fish, butter, and flour. The military duties of the fleet are performed by a corps of 1,190 marines.

The seamen who cannot afford to pay are admitted into the naval hospital gratis, the others pay a trifle; and from the artificers one schelling in the rix-dollar of their active pay is stopped for this institution, into which their wives and children are received. Attached to the hospital is a work-house, where 200 persons may earn their subsistence by spinning hemp. The wives and children of seamen, and seamen themselves superannuated, are received into this establishment in preference.

In 1813, January 1, the number and pay of the officers of the navy were as follow:

	Rix-dollars.
2 Admirals	2,880 per annum.
1 Vice-Admiral	2388
11 Rear-Admirals	2298

10 Com-

Denmark. Marine.

	Rix-dollars.
10 Commanders	1848 per annum.
13 Captain-Commanders	960
20 Captains	800
36 Captain-Lieutenants	276
50 First-Lieutenants	220
81 Second-Lieutenants	192

In 1660 a college of admiralty and of commissariat (answering to our admiralty and navy boards) were established. Since 1784 these two establishments have been united. Besides the military and civil administration of the navy, this college has the inspection of the coasting pilots, the royal seaports, the naval hospitals, and the jurisdiction of the persons employed in the fleet and dock-yards. This college is the supreme tribunal for the fleet; but it cannot direct the execution of a sentence of death, until it has been referred to the auditor-general, whose conclusions are submitted to the king.

Frederick V. regulated by two excellent codes whatever concerns the police and service of the fleet, and there is no country where seamen are more appreciated, and their services better rewarded, both by pecuniary emolument and marks of honour, than Denmark.

The expense of the fleet in 1782 was 916,600
..... 1790 1,200,000

The Danish maritime code is founded upon the antient Consulado del Mar and the Statutes of Oleron. By this code, no agreement between owners

owners and masters, or between masters and crews, are void, except they are in writing. The master cannot inflict punishment, without taking the advice of his principal officers, but he may turn on shore any person guilty of seditious conduct. A pilot losing a vessel by ignorance or negligence is held responsible for the damage, and if he cannot make it good he is punishable with death. If two vessels fall aboard of each other, and neither is in fault, the damage is to be supported equally, by the owners and freighters of the two vessels, in proportion to the value of their property in them. The damages resulting from the necessity of the ship's safety are to be borne by the entire cargo and the hull. In case of want of provisions, the captain may dispose of a part of the cargo to purchase them. Denmark. Marine.

In the times of barbarism originated the right of *wreck*, by which vessels wrecked and their cargoes became the prize of the lords of the soil on which they were stranded. Christian II., who employed every means to curtail the power of the nobles, and particularly by diminishing their resources, attempted to abolish this violation of the rights of nature and of property, and published an edict, regulating with equity the manner in which the inhabitants of the coasts were bound to conduct themselves towards persons shipwrecked, and the measures to be adopted with respect to the wrecks or goods drifted on shore. This law, however, met with violent opposition from the nobility, and was not put into execution. In the

Denmark. Marine. the following reign the same subject was resumed, and Christian V. had several regulations inserted in the code of laws towards this end. A great number of royal ordinances have since been published to the same purpose; nevertheless all the ancient abuses are not yet provided against.

By the actual laws respecting shipwreck, the crews have a claim of right to the assistance of the inhabitants of the coasts, who are to be called together on these occasions by the magistrate of the district. The goods saved are to be lodged in a place of safety, and the captain or others of the crew are not to be obliged to sell them. The penalty of death is pronounced against any person pilfering or appropriating the value of fifty silver marks. If the captain or others of the crew make any bargains with the people of the coast, they become void on proof of advantage having been taken of their situation. The wrecks and effects which come on shore, without any of the crew appearing, are to be collected and secured. The circumstances to be published in the newspapers of Denmark and the neighbouring countries, and if the owners claim them within a year and a day, they are to be restored, deducting the expenses. If no claim is made within that time, the produce of the sale (after deducting the expense) is divided between the king and the person who, by the antient customs, would have had the right of epave.

COMMERCIAL TREATIES

Between Denmark and Foreign Maritime Powers.

England, 1670. See England.

Portugal, 1766.

Art. 1. Admits the productions of the two Kingdoms (not prohibited) reciprocally into either, without prejudice to existing treaties with other nations; and engages, in future, to grant no commercial preference to the subjects of other states.

2. Admits the brandies and wines of Portugal into the Danish dominion, on the same conditions as the most favoured nations.

Russia, 1780.

The maritime convention between Denmark and Russia, for the security of the commerce of neutrals, declares as fundamental axioms,

1. That all neutral vessels have a right to navigate freely on the coasts of belligerents.

2. That the property of subjects of belligerents (contraband of war excepted) on board neutrals, should be free of right.

3. That a port ought only to be held in a state of blockade, when vessels of war of a belligerent are sufficiently near, and so posted, as to render the entry dangerous.

4. That neutral vessels ought not to be detained by belligerents, except on just grounds and evident facts; that they ought (when detained) to be judged without delay; and that besides the damages adjudged to the owners for detention

Denmark. Commercial Treaties.

detention without cause, complete satisfaction ought to be given for the insult to the flag.

Russia, 1782.

Art. 1. Peace and amity.

2. Liberty of conscience to subjects of either, residing in the dominions of the other.

3. Subjects of either, treated by the other as the most favoured nation.

4. All the ports of the dominions of either, open to the subjects of the other, except the Danish colonies out of Europe, and the Russian ports of the Black Sea, Caspian Sea, and other possessions in Asia.

N. B. Iceland, Greenland, and the Ferroe islands, were afterwards included in the exception, as Danish colonies.

5. Grants to the Danes permission to pay the duties at the custom-houses of Russia in the current coin (except Livonia, Estonia, and Finland).

6. Denmark grants a reduction of the Sound duty on the tobacco of the Ukraine, on fir rafters and potash, and certain modifications of the Sound duties in general.

7. All other merchandize, but the articles above specified, to pay but one per cent. Sound duty.

8. Russian vessels passing the Sound not to be subject to examination, but their papers to be considered as authority respecting their cargoes.

9. Farther regulations respecting the duty of the Sound.

10. Russian

10. Russian vessels having passed the Sound, and being obliged to return by stress of weather or accident, not to pay any second duty. Denmark. Commercial Treaties.

11. Russian vessels passing Gluckstadt, not to be subject to duty or visit.

13. Vessels of either party obliged to put into the ports of the other, in consequence of damage, to be allowed to repair free of all port charges, but not to sell any part of their cargoes.

14. Vessels of either party not to be obliged by the other to serve as vessels of war or transports.

15. Vessels of either party wrecked on the coasts of the other, to receive such assistance, and be treated as subjects.

16. One of the contracting parties being engaged in a maritime war, the vessels of the other not to be molested, though conveying the property of the subjects of the enemy of the party at war. Or free ships make free goods.

17. Axioms, respecting the *liberum mare*, in explanation of the foregoing article.

18, 19. Regulates the visiting of merchant ships of either party, by ships of war of the other, in time of war. Merchants to submit to the visit and not to destroy their papers. Vessels of war intending to visit, not to come within cannon shot of the ship to be visited, and not to send more than two or three men on board her. Merchant vessels being escorted by ships of war, the declaration of the officer commanding the convoy, that

Denmark. Commercial Treaties.

they contain no contraband of war, to be deemed sufficient.

20. Vessels on visit found to have contraband of war, to be brought into port for adjudication, and the contraband alone to be confiscated; and if the master of the vessel consents to give up the contraband at sea, the vessel to be permitted to proceed on her voyage with the rest of her cargo.

21. Specifies contraband of war. Naval and military stores.

22. Subjects of either party may cause vessels to be built for them in the ports of an enemy of the other, or may purchase vessels from the subjects of an enemy; and such vessels purchased or built, to be considered the property of the subject of the contracting party.

23. Subjects of the enemy of one party, being in the service of, or naturalized in the dominions of the other, to be considered as *bonâ fide* subjects of the contracting party.

24, 25. Allows the appointment of consuls of either party in the ports of the other, and regulates their functions.

26. Custom-house regulations.

27. The subjects of one party contracting obligations to their fellow subjects within the dominions of the other, may be obliged by decisions of the courts of law in the place of their residence.

28. The merchants of either party shall be permitted to pay for the merchandize they purchase in the dominions of the other, in the current coin of the place.

29. Guards

29. Guards against frauds which may be committed by factors.

30. The merchants of either party, residing in the dominions of the other, to be allowed to keep their books in what language and form they think proper.

31. If a subject of either party becomes a bankrupt in the dominions of the other, without having acquired the rights of citizenship, the creditors, by permission of the magistrates, shall appoint commissioners, who are to be invested with the effects of the bankrupt; and if the creditors to whom are owing two-thirds of the debts agree to an amicable arrangement, the other creditors must submit.

32. Permits to Danish merchants to build, purchase, or hire houses in all the towns of Russia, which have not privileges contrary to this permission: at Moscow, Petersburg, and Archangel, the houses actually occupied by Danish merchants to be exempt from all billeting. Similar privileges to the Russian merchants residing in Denmark.

33. Subjects of either party may quit the dominions of the other, without hindrance.

34. The effects and property of the subjects of either party, dying in the dominions of the other, to pass without obstacle to the legal heirs.

35. In case of war between the two parties, the subjects of either residing in the dominions of the other, to be allowed a year to dispose of their property, and quit the territory.

36. Duration of the treaty, twelve years.

MOROCCO, 1767.

Denmark. Commercial Treaties.

Art. 1, 2, 3, 4. Relates to the suppression of the Danish African Company, and the disposal of their effects in the empire of Morocco.

5. A free trade granted to all the subjects of Denmark.

6. The Danish flag to be respected by the Morocco cruizers, and the Danish consuls to have precedence of those of all the Christian powers.

7. Danish subjects not to pay greater taxes than other nations.

8, 9, 10. Security of Danish subjects and commerce.

11. Vessels wrecked to be assisted, and their cargoes to be preserved to the owners. A burying ground granted to the Danes in all the towns of Morocco.

12. Relates to Morocco cruisers visiting Danish merchant vessels.

13. Morocco cruisers to be supplied with passports by the Danish consuls, to prevent any mistake if fallen in with by Danish vessels of war.

14. Differences between a Dane and a Moor to be decided by the emperor or governor of the place, in presence of the consul.

15. Privileges of the consul residing at Sallee. 1. Appointment of vice consuls in other towns. 2. Consul's house, as well as those of Danish merchants, placed under the protection of the emperor. 3. Servants of consuls and Danish merchants to pay no taxes. 4. Consul to decide all disputes between

between Danish subjects. 5. To have the sole cognizance of all that respects the property of Danes dying at Sallee. 6. Allowed to have divine service performed in his house, at which all Christians may attend. 7. Provisions, furniture, &c. for the consul's establishment to pay no duties. Denmark. Commercial Treaties.

16. A Danish slave escaping from a Morocco cruiser, or a Moor escaping from a Danish ship of war, to be free.

17. In case of war, six months allowed Danish subjects to quit Morocco with their effects.

18. Contraventions of this treaty to be adjusted amicably.

19. Conditions on which this treaty is ratified. An annual present from Denmark of

12 iron 24 pounders
18 do. 18 do.
10 16 inch cables
10 13 inch do.
10 10 inch do.
2,000 oak planks, fit for building frigates,
6,500 piastres of Spain, in specie; or, in lieu of the whole, at the choice of the King of Denmark, 25,000 piastres.

20. All accidents happening in the conveyance of these articles, to be on account of the King of Denmark.

ALGIERS, 1772.

Preamble. The King of Denmark engages not to grant passports to vessels of nations not in amity with the Dey.

Denmark. Commercial Treaties.

Art. 1. Peace and amity.

2. The former duties of six per cent. on merchandize imported into Algiers by Danes, reduced to five per cent., the same as paid by the English, French, and Dutch. Goods reshipped for want of sale, and naval and military stores, to pay no duty.

3, 5. Vessels of the contracting parties meeting at sea, not to commit any act of hostility.

4. Algerine cruisers visiting Danish merchant ships to be content with the production of the passport.

6. Danish vessels wrecked on the coast of Algiers to be assisted, the cargoes preserved to the owners, and the crews not to be made slaves.

7. Algerines not to sell or hire their vessels to the enemies of Denmark, for the purpose of war.

8. No Algerine vessel permitted to approach the coasts of Denmark, to avoid misunderstanding.

9. Danish vessels, subjects, &c. taken by the cruisers of Tunis, Tripoly, or other enemy of Denmark, not permitted to be sold in the territory of Algiers.

10. Danish vessels anchoring in the ports of Algiers with prizes, not to be molested, and to pay no duties.

11. Danish vessels of war anchoring in the ports of Algiers to be supplied with provisions gratis; and if any slave escapes from the shore to her to be sent back.

12. Danish subjects not to be made slaves.

13. Property of Danish subjects dying in Algiers

giers to belong to their legal heirs, and the Danish consul alone to have cognizance of these cases. Denmark. Commercial Treaties.

14. Liberty of trade; and no Danish subject to be arrested for the debts of another, unless he has become bound.

15. Disputes between Danes and subjects of the Dey, to be decided by the Dey and Divan, between Danes by the consul only.

16. If a Dane having wounded or killed a subject of the Dey, escapes, the consul not to be molested on that account.

17. Security and protection to the consul, in his person and property; permission to have divine service performed in his house, and to be attended by the Danes at Algiers, as well as by Christian slaves.

18. In case of war, Danes to be permitted to quit Algiers.

19. Danish subjects embarked on board vessels of an enemy of Algiers as passengers, not to be molested in their persons or property.

20. Danish vessels of war anchoring at Algiers, to be saluted with twenty-one guns and to return the same number.

21. The provisions for the consul's house to pay no duties.

22. Any misunderstanding between the contracting parties to be amicably adjusted.

Exhausted by a ruinous war of twenty years, stripped of Livonia, Estonia, a great part of Pomerania Sweden. Commerce.

Sweden. Commerce.

merania and of the Dutchies of Bremen and Verden, Sweden, at the death of Charles XII. was reduced even below a secondary power both maritime and commercial. The Dutch at this period furnished Sweden with all the objects required from abroad, and in 1723 the Swedish merchant marine did not exceed 100 vessels. The exemption from the duty of the Sound was also lost to Sweden by the peace of Stockholm.

The alteration in the constitution after the death of Charles XII., by increasing the liberties of the people, created a general impulse towards national industry; agriculture was greatly extended and improved, the produce of the mines was doubled, and the fishery, now become productive by the arrival of herrings in the bay of Gothenburg, was protected and encouraged. In 1738 a navigation act was passed, which increased the activity of the ports, and the merchants and ship-owners uniting to the foreign active commerce those of carrying and coasting, the merchant marine increased rapidly, and thirty years after the death of Charles XII. exceeded 1,000 vessels.

Gustavus III., after the revolution which restored to the crown the high prerogatives it lost on the death of Charles, hoped to restore Sweden to her ancient rank among the nations, and accordingly appeared with some eclat on the theatres of war and negotiation; but his talents and activity were insufficient to contend against the greater resources of his neighbours, and against the civil dissensions that still convulsed the state: nevertheless,

nevertheless, though this prince failed in restoring to Sweden what she had lost under his predecessors, during his reign the arts flourished, and commerce was extended. Gustavus acceded to the armed neutrality of the North in 1780, and in 1784 the acquisition of the island of St. Bartholomew gave Sweden a share in the West India trade. Sweden. Commerce.

Though the loss of Finland has diminished the quantity of objects for commerce, the principal sources of national prosperity still remain to Sweden in her mines, her forests, and her fishery. Though the Russian iron has latterly entered into competition with that of Sweden, the superior quality of the latter ensures its demand and keeps up its price. The export of copper on the contrary has diminished, from the concurrence of English copper, as well as from the diminution of the produce of the mines of Fahlun, from those of Atwerdberg and Moland filling with water, and from the loss of those of Finland.* The other exports are pine timber, in planks, rafters, and beams. Pitch, tar, and potash, herrings and salmon, and some alum, vitriol, and vermilion.

The imports are corn, tobacco, salt, wines, oils, Spanish wool, hemp, soap, paper, colonial produce, cotton and silk manufactures, fine woollens and linens, works in steel and copper, hardware and cabinet ware. Some of these objects are however prohibited, in order to encourage the

* The price of Swedish copper has been reduced from forty to thirty rix-dollars the scheppund.

Sweden. Commerce.

national manufactures, but this prohibition tends only to increase their introduction by smuggling.

In peace the exports are valued at five millions and a half of rix-dollars, and the imports at four millions and a half.

The foreign commerce of Sweden is confined to a certain number of ports which have custom-houses. They are named staple stader, or staple towns, and are Stockholm, Gothenburg, Warberg, Halmstad, Norkoping, Landscrona, Carlscrona, Christianstad, Carlshamn, Calmar, Westerwik, Uddevalla, Marstrand, Gefle, and Abo and Wasa in Finland. The foreign commerce is supposed to be divided among these cities as follows:

Stockholm.....$\frac{7}{13}$ of the exports, and $\frac{1}{2}$ the imports.
Gothenburg.....$\frac{3}{13}$. ... .$\frac{1}{4}$
The other ports $\frac{3}{13}$.....$\frac{1}{4}$

To the foreign ports of the Baltic Sweden exports iron, steel, copper, lime, alum, and herrings, and receives in return corn, hemp, tallow, and hides: the balance is against Sweden 1,500 to 2,000 rix-dollars. To Holland the export is chiefly confined to iron: the principal returns are spices, tobacco, prepared colours, and papers; the balance is against Sweden.

To England the exports are iron, fir-timber, pitch, tar, potash, and herrings, chiefly for the consumption of the slaves in the West Indies: the imports are lead, tin, leather, beer, butter and cheese, coals, and every kind of manufacture;

ture: the balance is in favour of Sweden, near a million of rix-dollars. Sweden. Commerce.

To France Sweden sends iron, steel, copper and brass, fir timber, pitch, and tar, and receives wines, brandy, salt, fruits of the south, oil and silks: the trade is nearly balanced.

To Spain and Portugal the exports are the same as to France, and the returns are wines, salt, wool, fruits, and oil: the balance is something in favour of Sweden.

To Italy and the Levant Sweden exports all her territorial productions, and receives salt, spices, fruits, and cotton.

In 1800 Sweden had above 2,000 merchant vessels of twenty tons and upwards, but the rupture with England and the cession of Finland reduced them in 1810 to 1,500.

Since 1731, Sweden has had an East-India Company established at Gothenburg, whose charter was last renewed in 1786 for thirty years, the company then agreeing to pay to the crown 12,500 rix-dollars for every voyage. The speculations are entirely confined to the China trade, and it sends out four to six ships a year of 600 to 1,000 tons. The greater part of the imports are re-exported.

In 1786 a West-India Company was formed, which pays nothing for the privilege. The company for carrying on the northern whale fishery established in 1744 still exists, but in a state of languor. The other commercial companies of Sweden are a company for saving the cargoes of ships wrecked,

Sweden. Commerce.

wrecked, founded in 1736; and a marine assurance company, founded in 1739, whose capital is 166,666 rix-dollars, in 1,000 shares.

By the navigation act passed in 1738, foreigners can only import into Sweden the produce of their own countries or colonies, and only in their own vessels, and are subject to duties from which national vessels are exempt.

Swedish Fisheries.

The most productive fishery of Europe is that of herrings, on the Swedish shore of the Cattegat. It was only in 1748 that these fish first appeared in shoals in the gulf of Gothenburg, and when it was found that they returned regularly, government gave every encouragement to the fishery, by making it free, and granting bounties. During the first years, the fish arrived in August and September; but they have been gradually later, and at present do not arrive until November or December. This retardment has rendered the fishery more difficult, in consequence of the ice in the bays, and besides the fish at this late season are grown poor. To remedy the former inconvenience, large nets have been latterly brought into use, in order to take them at a distance from the shores at the moment of their first arrival, which is announced by the assembling and cries of the sea birds. The gradual increase of the produce of this fishery has been as follows.

In

Swedish Fisheries.

In 1752 ..... 1,000 tons.
1753 20,000
1761 100,000

From 1761 to 1798 there was a progressive increase, since when the produce has experienced considerable variations from year to year. From 1790 to 1796, Gothenburg, Marstrand, and Konghall salted 1,972,214 tons, and made 261,971 tons of oil, the whole valued at more than two millions of rix-dollars, of which three-fourths were exported foreign. The quantity consumed fresh during the same period was estimated at 50 to 100,000 tons. At the end of 1796, 7,100 boats and 30,000 persons were employed, and Gothenburg alone had 100 buildings on the coast for salting, each of which could cure from 8 to 10,000 tons. In 1797 there were in all 1,817 boilers for extracting the oil, each containing nine to ten tons of herrings, and seven to eight tons of water. This process is never commenced until a quantity of fish has been salted, supposed to be sufficient to answer the demand of the foreign markets; and when, consequently, the price lowers greatly. The substance of the herrings after the oil is extracted, called trangrums, is either used to manure the land or thrown into the sea*. Latterly it has been found that when fresh and mixed with a quar-

* It was formerly forbidden to throw this substance into the sea, on the supposition that it drove the herrings from the coast, and likewise raised the bottom, but these opinions have been found erroneous by experience.

Swedish Fisheries.

a quarter part of flour, it affords a nourishing bread. Attempts have also been made to procure from it volatile alkali and sal ammoniac.

The salt used is procured chiefly from England and Portugal. A barrel of salt cures three barrels of herrings, and fifteen barrels of herrings give one barrel of oil. The barrel contains 12 to 1,500 fish.

The Swedish herrings are considered inferior, both in the quality of the fish and in the manner of curing, to the Dutch; but as they are cheaper, they find a readier market in Russia and Poland.

The pilchard fishery is one of the most important branches of industry of the inhabitants of both coasts of the gulfs of Bothnia. On the breaking up of the ice, more than 200 families, with their children and servants, transport themselves to the islands and rocks that line the coasts, where they remain fishing till the end of autumn. The chief part of the produce is salted on the spot and sent to Stockholm.

The salmon fisheries of Sweden are also very considerable, both in the Cattegat and the gulf of Bothnia. From 20 to 25,000 tons of this fish are salted annually.

Marine.

Charles XII., to whose ambitious designs a military marine was necessary, paid attention to his navy, and in his descent on Denmark in 1700 he employed thirty-eight sail of the line. After the

the unfortunate battle of Pultowa, the marine was entirely neglected, and did not again begin to retrieve itself until Gustavus III. mounted the throne in 1771. Under him, Chapman, an Englishman, was the principal instrument of the restoration of the fleet, which in 1777 consisted of twenty-seven sail of the line of seventy to sixty guns, twelve frigates of forty-four, and twelve praams, &c. This prince also reformed the internal discipline and civil administration of the navy; and at his death, in 1792, the number of vessels was twenty-four of the line, sixteen frigates, and a flotilla of 200 to 300 praams, galleys, touromas, &c. The losses sustained in the wars with Russia in 1789 and 1790, and in that of 1809, has left Sweden only twelve or thirteen sail of the line, nine or ten frigates, and 100 to 150 vessels of the flotilla. This latter was stationed between Stockholm and Sweaborg.

Swedish Marine.

The materials for ship building which Sweden possesses, are iron, copper, pine planks, masts, pitch, and tar. She receives her oak timber and hemp principally from Russia.

The seamen for the fleet are procured from the maritime provinces, where seafaring-men are enrolled in a kind of marine militia, on the same footing as the land militia. Their number is about 15,000, but not above 1,000 are employed in peace. The sea officers are a High Admiral, an Admiral-in-Chief, an Admiral, and several Vice and Rear-Admirals. Officers under a certain rank

are

Swedish Marine.

are permitted to command merchant vessels; and the East-India Company's ships are usually commanded by captains in the navy.

The civil administration of the marine is lodged in a college of admiralty, composed of a president, two vice-admirals, two colonels, and three counsellers. The corps of coasting pilots is under its jurisdiction.

Disabled seamen are relieved by a fund, supported by deductions from the pay of those serving, and from some duties appropriated to this purpose.

Sweden has Consuls-general at Bordeaux, Havre, Marseilles, Lorient, Cadiz, Elseneur, and Petersburg; and Consuls at

Algiers,	Genoa,	Isle Re,
Alicant,	Honfleur,	La Rochelle,
Bayonne,	Leghorn,	Riga,
Boston,	London,	Rochefort,
Calais,	Madeira,	Rouen,
Cagliari,	Malaga,	Sallee,
Carthagena,	Montpelier,	Tripoli,
Cette,	Nantes,	Tunis,
Charlestown,	Nice,	Trieste,
Croisic,	Ostend,	Venice,
Dunkirk,	Philadelphia,	Wyborg.

COMMERCIAL TREATIES

Between Sweden and Foreign Maritime Powers.

PORTUGAL, 1641. The Swedes to enjoy the same commercial privileges as the Dutch.

SPAIN, 1651, 1679, 1748. Swedish commerce to enjoy perfect security in all the ports of Spain.

RUSSIA, 1721. The Swedes to be allowed to purchase for 50,000 rubles annually, of corn, at Revel, Riga, and Arensberg, free of duty.

SICILY, 1748. Reciprocal surety of commerce.

TURKEY, 1737. Freedom of commerce to the Swedish flag in all the ports of Turkey, on condition of paying 300 aspers for each vessel, and three per cent. on the imports and exports.

BARBARY STATES. Sweden has similar capitulations as Denmark.

AMERICA, 1783. Reciprocal surety of commerce.

FRANCE, 1741, 1786. 1. French subjects permitted to import into Sweden all the productions of France, not prohibited on the payment of the same duties paid by Swedes importing the same productions in foreign bottoms. 2. Swedish vessels exempted from port duties in France, except when employed in the coasting trade of France. (This stipulation rendered nugatory by the French Navigation Act, 1794). 3. The subjects of

Sweden. Commercial Treaties.

France to enjoy in the port of Wismar, the exclusive privilege of paying only three-fourths per cent. on the imports in their own vessels. 1786. By convention, this last privilege was changed to the establishment of a transit dépôt at Gothenburg, free of all duties, except when the merchandize is taken from the dépôt to be introduced into Sweden by land; in consideration of which privilege, France ceded the Island of St. Bartholomew in the West Indies.

Commerce. Prussia.

Frederick I., son of Frederick William the Great Elector, was raised to the dignity of King of Prussia in 1701. He was succeeded by his son, Frederick William, in 1713, who considerably increased the revenues of Prussia. Frederick II. deservedly named the Great, succeeded to the throne in 1740. While he conducted the Prussian armies to victory abroad, he neglected nothing to improve his subjects, as well in industry and commerce, as in literature and the fine arts. His wise and vigorous administration implanted the habitude of order and labour, and before the end of his reign the manufactures of Prussia were capable of supporting an advantageous concurrence with those of the south. The maritime cities were assisted in the improvement of their ports, and encouraged to build vessels, and four canals were formed to extend inland communications. The Prussian monarch did not aspire at becoming a great naval power, but contented himself

himself with ensuring safety and respect to the Prussian flag flying on trading vessels, in all parts of the ocean. In 1751, when the province of East Friezeland was ceded to Prussia, two companies were established at Embden, one to trade to India, and the other to China; but they were unsuccessful from the commencement, and the war of 1756 suspending all their operations, they were dissolved at the peace of 1763. These monopolies and several others, of which Frederick did not foresee the evils, as well as the multiplied duties and frequent prohibitions, discouraged great enterprises. Private merchants were unable to support the concurrence of the Maritime Company established in this reign, and to which was also granted the monopoly of many branches of commerce. The import of salt, in particular, was often so shackled in the ports of Prussia, that the Prussians were obliged to seek it in those of Courland and Livonia; at the same time that the tolls established on the routes from the interior, caused the Poles to prefer conveying their productions to the Black Sea, rather than to the Baltic. Commerce. Prussia.

This system of restraint has been softened by the successors of Frederick, and the Prussian ports, including Dantzick, now export almost the whole of the commercial productions of Poland, consisting of corn, fir plank, and rafters, masts, hemp, tar, pitch, potash, hides and tallow, leather, honey and wax. Among the other objects are the oak of Pomerania, brandy, woollens,

Commerce. Prussia.

linens, caviar, and amber. The caviar is principally made from the great sturgeon fishery in the Frisch-Haf, and exported from Pillau.

The imports into the Prussian ports are wines, coffee (two millions of pounds), sugar (two millions), tobacco (two millions and a half), spices, salt, iron, copper, Spanish wool, herrings, flax-seed of Livonia and Courland, which is of a superior quality, and with which the plains of Pomerania and Brandenburg are sown. Dye-woods, colours, and other objects used in the arts, are also introduced by sea.

Most of the Prussian ports have yards for building merchant vessels, and towards the close of the last century the merchant marine consisted of 1,200 ships, including those of East Friezeland (200 to 300). Konigsberg, Elbing, Memel, and Stetin, were the chief trading ports, and were visited by the English, Dutch, French, Swedes, and Danes.

The various sides which Prussia has taken in the wars since 1793, has circumscribed her commerce at various periods. While at peace with England, her relations with that country formed the most important portion of her foreign commerce; and in 1801 to 1802, the balance was estimated at one million and a half sterling in her favour.

Dantzick.

After the fall of the Hanse association, Dantzick retained a great portion of the commerce of the Baltic, and conjointly with Lubeck, Hamburg, and Bremen, still preserved a commercial preponderancy

derancy in the north. The commerce of Dantzick depending principally on the free navigation of the Vistula, as the Prussians extended their dominion on the banks of this river, the sphere of activity of the Dantzickers was gradually contracted, until, at length, the city itself being incorporated with the Prussian dominions in 1793, it was assimilated with the other ports in regard to trade. By the treaty of Tilsit, Dantzick was restored to its ancient privileges, under the protection of Prussia and Saxony; and it was at the same time stipulated, that the navigation of the Vistula should be free of all tolls. The events which have since taken place threw Dantzick into the hands of the French, but it is now again occupied by the Prussians.

Commerce. Dantzick.

Dantzick exports the territorial productions of Poland, consisting of oak and other timber, corn, hides, horse-hair, honey and wax, and the corn brandy of her own distilleries.

Swedish Pomerania and Mecklenburg draw the greater part of their commercial objects from the soil; such as salted and smoked meat, hides, wool, butter and cheese, corn and fruits. The English generally take off a considerable portion of the corn of Mecklenburg; that of Pomerania, as well as the fruits, go to Sweden. The vessels of Wolgast, Greifswald, Stralsund, Barth, Rostock, and Wismar, also convey their productions to the ports of the Baltic, and the ocean.

Swedish Pomerania and Mecklenburg.

At the close of the seventeenth century, when Peter the Great ascended the throne, Russia was

Russia.

Commerce. Russia.

still in a state of barbarism, in comparison with the other nations of Europe. This prince possessed from nature a great activity of disposition, an impatient ardour, and a perseverance which obstacles only served to stimulate. With such a character, it was natural that Peter should form the project of improving his subjects, and of making Russia act a part amongst the nations of Europe; but to this effect it was necessary to have communications with the ocean, and the procuring them was the first object of the enterprises of the Czar. He first turned his views towards the White Sea, and in person visited Archangel; but observing that its distance, and the severity of its climate, opposed insurmountable obstacles to any considerable extension of industry and commerce, his next object was the Black Sea, situated under a more favourable climate, but of which the coasts were possessed, and the navigation watched with jealousy by the Turks. A war breaking out between the two nations, Peter attacked Azoph, but failed in the attempt, for want of vessels to block it by water. A fleet being, however, quickly created, the following year put him in possession of this fortress and its territory, but which the defeat of Pruth again obliged him to relinquish.

Peter now seriously occupied himself in the creation of a navy; and in order to give full effect to his designs, he visited England, Germany, and Holland, in order to acquire a knowledge of the art of constructing vessels, and of the details of a marine,

marine, and even worked as a common ship carpenter in the dock-yard of Saardam. During his travels, the Czar visited Riga, Konigsberg, and other ports of the Baltic; the spectacle of whose activity and opulence could not fail to strike him, and to give him a just idea of the importance of maritime commerce. Not far from the frontiers of his dominions he met Augustus, who, on being raised to the throne of Poland, had promised his subjects to reconquer the Polish provinces, reduced under the dominion of Sweden; but, being too weak to execute this promise alone, he proposed a coalition to the Czar. A perspective, conformable to the views of Peter, now presented itself; and on his return to his dominions he armed, and the coasts of the Baltic became the theatre of his efforts. While Charles XII. was overrunning Poland and Saxony, Peter seized on Ingria, and founded Petersburg. The unfortunate battle of Pultowa leaving Peter no competitor, grander prospects opened on him, and he united Estonia and Livonia to his dominions. A. D. 1721.

Commerce. Russia.

In spite of the superiority of situation, and the encouragement given to foreigners to visit the infant capital, a great part of the productions of Russia were still sent to Archangel, until prohibitions and punishments being added to premiums and privileges, Petersburg at last triumphed. The first foreign vessel that entered the Neva was a large Dutch ship, richly laden; and her arrival caused such satisfaction to the Czar, that he granted this vessel an exemption from all duties

Commerce. Russia.

while she should continue to trade to Petersburg: and by frequent repairs, she was kept in existence for more than half a century. So early as 1718, 100 ships of the same nation loaded at Petersburg; and other nations following the example of the Dutch, it was soon known, that a vast field was opened in the north for the exercise of talents and industry, and strangers of all nations flocked to Russia to improve or seek their fortunes. The merchants of Germany, England, France, Holland, Denmark, and Sweden, established themselves in the cities for the purposes of commerce, while the English and Dutch also supplied ship-builders and officers, both of land and sea, who improved the organization of the armies and fleets.

The plans of Peter were not lost sight of by his successors; and Catharine II., in particular, by her victories and her negociations, as well as by the encouragement of foreigners, and the protection of commerce, accelerated the progress of industry and civilization amongst her subjects.

Although a part of the commercial productions of the Russian dominions are still exported from Archangel, and another part from the ports of the Black Sea, since its navigation has been opened, the principal commerce of Russia is by the Baltic. From its ports on this sea are exported corn, hemp, flax and flax-seed, fir timber, (masts, deals, rafters), pitch, tar, and pot-ash, iron and copper of Siberia,* hides and tallow, honey and wax,

* The iron of Siberia is much inferior to that of Sweden, but its low price ensures it a ready sale.

wax, rhubarb, tobacco in leaf, fish-oil, isinglass, and caviar, furs of Siberia,* sea-birds' feathers, horse-hair, hogs' bristles, and neats' tongues. The only manufactured objects exported are saltpetre, cordage, and sail-cloth; coarse linens, mats, and soap. Commerce of Russia.

The principal imports are English manufactures, *viz.* fine woollens, glass and earthenware, stationery, all kinds of cottons, mathematical instruments, cutlery and hardware, tin and lead. The other imports are colonial produce, particularly coffee, of which Petersburg imports near one million and a half pounds; sugar, of which it receives near five millions of pounds; tea and spices, wines, liqueurs, fruits, and oil of the south; fine linens of Holland and Silesia; silks of France, watches, toys, &c. of ditto, besides various utensils of iron and copper.

In the middle of the eighteenth century the exports of Russia from the Baltic did not exceed twelve or thirteen millions of rubles, and the imports about eight or ten millions. At the close of the same century the exports exceeded forty-five millions, and the imports were above thirty-two millions. The general statement of the Russian maritime commerce (independent of the Caspian and Siberian Seas†) was as follows:

Exports.

* Viz. castors, sables, foxes of various colours, wolves, squirrels, bears, rats, and white hares. In 1793, Russia exported by sea, for 400,000 rubles of these furs.

† The amount of the commerce of the Caspian Sea, in late years, has been about 100,000 rubles of exports, and 900,000 of imports.

Commerce of Russia.

	Exports.	*Imports.*
	Rubles.	Rubles.
1802, From the Baltic.....	47,000,000....	33,000,000
1804,.....	45,000,000....	27,000,000
1805,.....	52,000,000....	29,000,000
1802, From Archangel.....	5,000,000....	550,000
1804,.....	2,200,000....	390,000
1805,.....	3,750,000....	390,000
1802, From the Black Sea	3,000,000....	2,055,000
1804,.....	5,000,000....	4,200,000
1805,.....	7,400,000....	5,356,000

Catharine II., by duties and prohibitions, endeavoured to diminish the mass of imports; and by late regulations, certain objects are allowed to be imported by foreigners only into the ports of Petersburg, Riga, Revel, and Liebau. But though the manufactures of Russia have advanced beyond the state of infancy they were in half a century past, they are still very insufficient to afford all the objects that increasing civilization renders necessaries to the higher classes, such as fine manufactures for cloathing, wines, ornamental furniture, &c.

Russia presents a singular phenomenon among the maritime powers, that of possessing an imposing military marine, without any commercial one. The total number of her merchant vessels that navigate the Baltic and the ocean not exceeding fifty; 100 lesser vessels serve to carry on the coasting trade of the Baltic, and about 100 craft, of twenty to thirty tons, are employed in loading

loading and discharging the vessels at Cronstadt that cannot enter the Neva. Not one of the Russian ports, except Petersburg, has any establishments for building or repairing ships. Even the few ships that sail under the Russian flag from Riga and Revel, belong to the merchants of Hamburg and Lubeck, who, in order to profit by the drawback of three-eighths of the duties on imports, have purchased the freedom of these cities. Commerce. Russia.

The want of a merchant marine reduces the foreign maritime commerce of Russia almost entirely to a passive state; and by far the greatest portion of it is in the hands of the English, whose commercial relations with Russia date from the discovery of Archangel, in the middle of the sixteenth century.

France had long viewed the English influence, both commercial and political, with jealousy, and left no means untried to weaken it. The intrigues of her ambassadors at Petersburg were, however, unsuccessful until 1787, when Catharine II. in consequence of England refusing to acknowledge the principle, that free vessels make free goods, in her turn refused to renew the treaty of commerce then expired. The French ambassador, taking advantage of this momentary alienation, procured a treaty, by which his nation was allowed the same commercial privileges as the English. The revolution, however, prevented this treaty from being effective; and, in 1793, the ancient one with England was renewed for twenty years. The chief advantage

Commerce. Russia.

advantage enjoyed by virtue of this treaty, is the privilege of paying the custom-house duties in the current money of Russia (paper as well as specie); which gives the English merchants an advantage of twelve per cent. over all other nations, who are obliged to pay these duties in rix-dollars species at a certain losing valuation.

Russia has two trading companies, one for carrying on the herring fishery in the White Sea, and the N.W. American Company. A company has also been founded at Petersburg for saving the cargoes of vessels wrecked in the Gulf of Finland; and the fourth part of the property saved is adjudged to the company as salvage. Several *ukases* also prescribe to the inhabitants of the coasts the measures to be taken to assist the crews, and save the cargoes of the stranded vessels.

The fisheries of Russia in the Baltic, though considerable as to produce, afford no export; the whole being consumed in the country, where the long religious fasts cause a great consumption of fish. The Russians of Archangel carry on a large cod fishery on the north coast of Lapland to the North Cape in open boats, and their larger vessels frequent the sounds on this coast as far as Tromsoe, and exchange meal with the Laplanders for fresh fish, which they salt in their vessels. The river fisheries, and particularly of the Wolga, afford caviar, isinglass, and some oil for external commerce.

Under

Under the immediate successors of Peter the Great the Russian navy was neglected, and had little more than a nominal existence. When Catharine II. mounted the throne, this ambitious and enlightened princess again invited English and other foreign ship-builders and officers to Petersburg; and among the English was Sir Charles Knowles, a captain in the British navy, who united the professional knowledge of the complete practical seaman to an intimate acquaintance with the theory of naval construction. Under his direction the Russian marine was soon put on a respectable footing, and many of the abuses in its civil administration corrected. Towards the end of Catharine's reign the marine again declined, but revived under Paul, who built many ships, and introduced several improvements into the administration. *Marine. Russia.*

The Russian dominions afford every article necessary to the construction and equipment of a navy. At Cronstadt and Petersburg the ships are built of the oak of Kasan; the Ukraine and government of Moskow supply hemp; masts are procured from the vast pine forests of Novogorod, and from the Polish provinces; pitch and tar from Wyborg; iron and copper from Siberia. In spite of all these advantages the marine is far from having attained a height proportionate to the land forces of the empire. The want of ports on the ocean, and of colonies and fisheries abroad, as well as the state of vassalage of the peasantry, which binds them to the soil, are the chief causes that keep

Marine. Russia.

keep down the military marine, as well as the commercial, by preventing the formation of seamen. The government has, however, latterly done something towards forming national seamen, by obliging all Russian ships to have two-thirds of their crews natives; and binding the captains, under a penalty of 240 rubles, to bring back to port every Russian seaman he carries from it. There is, however, no restriction with respect to the countries of the captains and officers of merchant vessels; and the greater number of those in the Russian foreign traders are foreigners. It has also been latterly the custom to send young men, at the expense of the crown, into the English service to learn the profession, and they have been admitted into the British navy as volunteers.

In 1803 a school of naval architecture was founded at Petersburg, the expenses of which are paid by government, and amount to upwards of 200,000 rubles a year. There is also a similar institution at Nicolaef in the Black Sea. The palace of Oranienbaum has been appropriated for a naval academy, in which 600 cadets are educated at the expense of the crown. They are admitted at the age of five years, and remain till seventeen: during the last three years, they make an annual cruise in the Baltic, as far as Revel. There are also navigation schools at Riga, Archangel, and Irkutsk in Siberia, and a school for Baltic pilotage at Cronstadt.

The Imperial marine is divided into four squadrons, stationed in the Baltic, the Black Sea, the Caspian,

Caspian, and sea of Ochotsk. At the close of 1807, the different squadrons were composed as follows: Russian Marine.

	Line.	Frigates.	Brigs and Cutters.	Small Craft.
Baltic fleet.....	20	14	6	19
Black Sea fleet...	12	4	7	18
Building and repairing.....	18	16	46	
	42	34	59	37

Baltic flotilla..... 20 gallies... 25 floating batteries 81 gun boats... 16 yawls.
Black Sea do..... 40 gun boats... 80 falconets.
Caspian do..... 6 vessels carrying 70 guns.
Ochotsk do..... 11 vessels ..... 86 guns.

The number of seamen and marines on the war establishment is 80,000; and the annual expense, one million and a half of rubles. The civil administration of the marine is lodged in a college of admiralty, consisting of a president, vice-president, and four admirals. The buildings of the admiralty are at Cronstadt.

The pay of the Russian officers of the navy is:

High admiral.....per annum...	7,000 rubles.
Admiral	3,600
Vice-admiral	2,160
Rear-admiral	1,800
Captains, 1st class	636
2d do.....	444
Captain-lieutenant	318
Lieutenant	212
Midshipman.....	126

Seamen,

Russia. Marine

Seamen, 1st class ..... 1,114 rubles
2d do..... 764

Tables of the Variation and Nature of the Baltic Trade.

Commerce

Table I. General abstract of the vessels that passed the Sound, in and out, in the following years:

1750 ..... 3 to 4,000
1752 6,000
1770 7,736

Flags.	1782	1783	1790	1796	1799	1800	1802
English	1,264	2,836	3,788	4,455	2,599	3,139	
Dutch	16	534	2,009	(war with England)			
Danes	1,634	1,773	1,559	2,157	1,571	1,480	
Prussians	1,097	2,050	698	1,773	1,420	1,763	
Swedes	2,121	2,466	430	2,505	1,674	1,941	
Dantzick	328	203	248	249			
Rostock	89	118	339	193	137	278	
Bremen	240	263	177	93	91	80	
Hamburg	50	59	104	40	5	31	
Lubeck	112	97	89	70	54	60	
Oldenburg		28	24	120	33	39	
Pappenburg				232	97	152	
Imperial	505	528	6				
Russians	158	147	6	7	13	13	
Courland		14	22	10			
French		8	132	(war with England).			
Spanish		7	32	25			
Portuguese	38	28	28	14	2	6	
Venetian	3	2	6				
Neapolitan	1		4				
United Amer.		4	44	169	152	59	
	7,656	11,165	9,735	12,112	7,848	9,041	12,164

Table

Table II. Abstract of the principal objects exported from, and imported into the Baltic, on an average of several years before 1800. Commerce.

Exports.	*Cargoes.*
Grains, flour, linseed, and rape oil, from Russia, Prussia, Pomerania, and Lubeck	1,000 to 1,200
Cordage, sail-cloth, and others, from the above countries	30.... 40
Masts, flax, and tow, from Russia and Prussia	400.... 450
Masts, planks, rafters, and ship-timber, from Sweden, Russia, and Prussia	1,000 .. 1,300
Pitch and tar, from Sweden, Prussia and Russia	100.... 150
Potash, from the same countries	100.... 110
Iron, copper, brass, steel, alum, cannons, and anchors, from Sweden and Russia	450.... 600
Tallow, hides, and leather, from Russia and Prussia	70.... 80
Salted and dried fish, from Sweden and Prussia	15.... 20
Stones, lime, chalk, gunpowder, and saltpetre, from Sweden and Denmark	20.... 30

Commerce

Imports.	*Cargoes.*
Herrings, dried fish, and fish oil, from Western Sweden, Norway and Holland	430 to 450
Salt of France, England, Spain and Portugal, and from the depots of Hamburg, Bremen and Gothenburg	370... 400
Wines, sweet oils, brandy, vinegar, beer and fruit, of France, Italy, Spain, Portugal and England...	200....250
Sugar, coffee, and sirups, from England, Holland and America	20.... 30
Rice, groats, and malt, from the Levant, Holland, England, Hamburg, East Friezeland and America.....	26.... 30
Butter, cheese, and salt provisions, from Denmark, England, Holland and East Friezeland	28.... 30
Coals from England	200....250
Linens, woollens and cottons, of England, Holland and France..	30.... 40
Glass, earthern-ware and marble, from England, Holland, Germany, and Italy.....	100....150

THE BRITISH SEA.

QUITTING the Baltic and doubling the point of Scagen, we enter the Scagerack, which being more open to the ocean than the Cattegat, its waters are much salter, and its tides more sensible, rising six or seven feet. The Scagerack leads us into the British Sea, generally called the North Sea, and sometimes from its antient name, the German Ocean. General View. Banks.

The most prominent feature in the natural history of the British Sea, is its numerous banks, which afford the richest fisheries of flat fish in the world. The principal is the Dogger Bank, named from the number of Dutch vessels of this denomination, always seen on it in the fishing season. It commences near the coast of England, about nine leagues north of the mouth of the Humber, and extends nearly to the coast of Jutland; the depths over it are from eight to twenty-nine fathoms. It is celebrated for the great naval action between the English and Dutch, in 1781.

South of the Dogger is the Well Bank with ten fathoms, and between them the silver pits, several deep holes which have received this name from supplying London with cod; these fish preferring the deepest water, while the flat fish are taken on

General View. Banks.

the banks with nets. Abreast of Sylt Island, on the coast of Sleswick, is the White Bank with twenty-one fathoms, and nearly midway, between the coasts of Norfolk and Holland the Brown Bank with fourteen fathoms; between which and the coast of Holland is the bank called the Broad Fourteens. The Long Forties is a bank between thirty-five and forty miles from the English coast, and extending from nearly abreast of the Tees mouth to the N. E. point of Scotland: the least water on it is thirty-five fathoms. Between this bank and Marr's Bank, opposite the Frith of Forth, are the pits of Montrose, muddy holes of three or four miles in diameter, with 50 to 100 fathoms. North of the Dogger is the Long Bank with twenty-five fathoms. The Jutland reef stretches off from the N. E. point of Jutland.

Besides these great banks there are many others lining the coast, which render the navigation of this sea extremely perillous in winter, when almost constant fogs, caused by the strong evaporation over the banks, precludes celestial observations. The strong currents also increase the danger, particularly as they seem hitherto not to be generally understood. Near the coasts of Great Britain they are said to set from the north, while on those of the continent they are from the south. The former appears to be the constant polar current, and the latter is probably a counter current caused by the long and narrow form of the sea; it runs round the Scagen point into

Currents.

into the Cattegat, where, meeting with the stream out of the Baltic, irregular currents are produced. General View.

The tides in the British sea are regular when not influenced by temporary or local causes, and the general rise from seven to eight feet. In the gulf of the Elbe they are sometimes affected by three foreign impulses. 1. By a current from the Norwegian sea produced by a long continuance of N.W. winds; 2. by the counter current above noticed from the south; and 3. by the stream of the Elbe. The common tides at Hamburg rise only seven or eight feet, but in strong N.W. winds they rise twenty feet or more. Hamburg is thirty leagues from the sea, and these extraordinary floods traverse that space in five hours and a half, and it requires from three to five quarters of an hour to overcome the stream of the river: hence the duration of the flood is but from four to four and a half hours at the city, while the ebb runs down seven and a half to eight hours. Tides.

The whole west coast of Jutland is composed of sandy downs which have filled up the bays and inlets, that according to the annals of the north antiently afforded retreats to the Scandinavian pirates. It has but two noted points. The first, named Robsnout, is a high bluff head, eight leagues from the Scagen point, the land on each side being a low barren sand. It would appear that the sea has washed away a considerable portion of this point, and hence its position, as copied from Coasts. Jutland.

Coasts. Jutland.

old charts into the modern ones, is very erroneous. The second remarkable point is the rock of Skarrild.

Towards the north the coast of Jutland is unbroken, but on the south it has several inlets. Nissumfiord is entered by the pass of Torsmiade. The gulf of Rinkœbing, or Kincopper Diep, is a large basin, separated from the sea by a narrow strip of land called the Numet, and is entered from the south by the pass of Nyminde. In the gulf is the island Holmsland, and it receives the Skiern, one of the principal rivers of Jutland. The Grawe Diep, on the southern frontier of Jutland, receives the Starup.

Sleswick and Holstein.

The coasts of Sleswick and Holstein to the mouth of the Elbe are composed of the depositions of the ocean, which form the finest pasture lands; but whose preservation from the irruptions of the sea requires unceasing vigilance and expense, the antient dikes being insufficient for this purpose. In 1634 in particular, a dreadful irruption poured on the coast from Rypen to the Elbe, by which several villages were swept away, and 1,500 persons, besides thousands of cattle, perished: since this catastrophe the art of constructing the dikes has been perfected, and they are now of a solidity that seems to bid defiance to the fury of the ocean; they are composed of stiff clay, are twenty feet high, and twelve to fourteen broad at top, with ditches and locks to carry off the superfluous water from the lands. These dikes are the object of a special police, and are examined regularly

regularly in spring and autumn. They are the only elevations on the coast, and point out the successive formation of the lands, which when newly enclosed are called Kog. Their superficial soil is a fat earth, mixed with sand, under which is pure sea sand, or mixed with ferruginous gravel, and the thirdbed is a bluish argile, which spread on the surface forms a good manure. Outside of the dikes are downs or hillocks of sand, which the winds raise and level alternately, and beyond these again in the sea is a chain of banks called Hallïgen, successively left dry and covered by the sea; they are the ruins of the great isle of Nordstrand, torn to pieces by the irruption of 1634. *Coasts.* *Sleswick and Holstein.*

The coasts of Sleswick and Holstein have many inlets, but most of them can only receive small vessels: the principal are the gulfs of Rypen, Tondern, and the Heever, between Nordstrand and the main, in Sleswick, and the gulf of Tonningen between Sleswick and Holstein. The only rivers of any consideration are the Skodbrog which separates Jutland and Sleswick, the Nipsaa which falls into Rypen Diep, and the Trenen into the Heever. The Eyder separates Sleswick and Holstein and empties itself below Tonningen.

Islands.

The islands on the coast and in the jurisdiction of Sleswick are Fanœ seven miles long; Manœ and Gamel Manœ before Rypen Diep; Rom, seven miles long, with 1,500 inhabitants, who feed numbers of cattle; Sylt, seven leagues long, but very narrow, is celebrated for its oysters, and for being visited in winter by vast flocks of wild

Islands. Sleswick and Holstein.

ducks, of which 40,000 are said to be killed annually; Fora, Amrom noted for its oysters. Nordstrand, Pelworm, Hooge, Norderoog, Suderoog, and Sudfall, are fragments of the isle of Nordstrand laying off the Heever.

The port towns of any consideration are in Sleswick, Rypen on the Nipsaa, four miles from its mouth which forms a good port for small vessels. The town is fortified and protected by a castle: it exports corn, horses, and oxen. Husum on the Heever has 4,000 inhabitants and a similar trade to Rypen: it has also manufactories of cotton, linen, and leather. Tonningen on the Eyder, ten miles from its mouth, derives its opulence from the canal of Kiel; vessels of thirteen feet ascend to it.

The ELBE rises in Silesia and after a course of 500 miles empties itself into a large gulf separating Holstein from the territory of the Elector of Hanover. The navigation of this river embraces Silesia, Bohemia, Brandenburg, Mecklenburg, Hanover, and Holstein, and by canals uniting it with other rivers, the inland navigation is extended to the Baltic and into the interior of Prussia and Poland. The tide ascends six leagues above Hamburg, and in the extraordinary elevations which we have noticed inundates the streets of this city, while in strong easterly winds, on the contrary, the canals which derive from the river are left dry. There are many islands in the river, all fertile and several of them inhabited.

On the right bank or Holstein side of the Elbe the

the towns in succession are Brunsbuttle, Gluckstadt at the mouth of the Ryn, the chief town of the dutchy, with 4,000 inhabitants, a strong fortress and good port: it has no water but that preserved in cisterns from rains. Colmar and Blankennie are fishing villages between Gluckstadt and Altona. Holstein.

ALTONA is a handsome modern town of 24,000 inhabitants, with extensive manufactories of cordage, leather, tobacco, &c.; it has also sugar refineries, distills aqua fortis and brandy, and builds merchant vessels for sale. It is largely concerned in the herring and northern whale fisheries.

HAMBURG is situated at the confluence of the little rivers, Alster and Bille, with the Elbe, and about eighteen leagues from the sea. It is built in the gothic stile, the streets narrow and crooked, and it has many canals crossed by eighty-one bridges. It is surrounded by a wall, on the top of which two carriages can drive abreast. The French while in possession of it constructed many other works; its population is 120,000. When independant, it was the emporium of the commerce between England and the interior of Germany, 2,000 vessels entering it annually, and the imports and exports exceeding two millions and a half sterling. It had then 200 large merchant vessels belonging to it. The English had a factory here enjoying great privileges.

Heligoland (Holy Island) is nearly equidistant, or twelve leagues, from the mouths of the Elbe, Weser, and Eyder. From being of considerable size,

size, the action of the waves has reduced it to a great rock, a mile in circuit, rising in the centre to a round elevation, the ascent to which is by 150 steps. What little soil it possesses is sand and clay: the shores rise perpendicularly, and the island is surrounded by reefs and banks, the remains of its antient territory. The inhabitants, who amount to 2,000, are descended from the antient Friezelanders, whose language and manners they preserve, they subsist by fishing and pilotage as well as by smuggling English merchandise into the ports of the continent. On the north end of the island is a light house, and on the south a little haven for the fishing boats.

Germany. South of the Gulf of the Elbe is the indentation called the Braake, which receives the Weser and the Jade. The former empties itself through many banks eight leagues below Bremen; vessels of 500 tons ascend it three leagues to Vegesak, and those under 200 ascend to Bremen. It is of great moment to the commerce of Germany, by the navigation it opens with the interior, and has a good salmon fishery. The Jade is a deep arm of the sea.

From the Braake to the Helder point, the coast is lined with islands and banks, amongst which are the entrances to the Dollart and Zuyder Zee. The Dollart separates the Prussian territory of East Friezeland from the dominions of Holland.

It

It receives the Ems and several other rivers. The Zuyder Zee (Southern Sea) has some islands and a great many banks, and is entered by several channels.

The islands on these coasts are Werck and Teutel before the Braake, both low sand-banks; Wangeroge, Spieckeroge, Langerode and Baltrum, dependencies of East Friezeland; as are Norderney frequented for sea-bathing, Buisson, Juiste and Borkum, overflowed in some parts at high water, but well inhabited. Between the two last is the channel into the Dollart, called the East Ems. The islands belonging to Holland are, in the province of Groningen, Rottum, high and steep on the west end, but all the rest low with hillocks of sand; on the east end are two beacons. Between it and Borkum is the channel into the Dollart, called the West Ems. Bossels or Bosch, is almost entirely overflowed at high water. In the province of West Friezeland are Schiermonikooge, formerly joined to the main and now separated from it by an encumbered channel, called the Wadden; on the island are only some scattered houses. Ameland, three leagues long and one broad, has also been separated from the main land; it is noted for the amber occasionally found on its shores, and has several populous villages. In the province of North Holland are Schelling, three leagues long and two broad, with a light-house on its west end; between it and Ameland, is the northernmost channel into the Zuyder Zee. Vlieland (Fly Island) is three leagues long and one broad. Islands.

Holland. broad. It has several hills on the west end, and white sand downs on the east; on the N.E. end is a light-house. Between it and Schelling is the second channel into the Zuyder Zee, called the Westerbomgatt and Vlieter. The Texel island is four leagues long, including Eyerland on the N.W. joined to it by a causeway; between it and Vlieland, is the third channel, called the Pan, with but fourteen feet. The Texel is one of the stations of the Dutch fleet and is strongly fortified. Between it and the Helder point is the fourth channel into the Zuyder Zee, called Mars Diep, opposite which are the two Hake sands, of late years so fatal to British ships of war returning from the Baltic in winter.

From the Helder point to the north channel of the Meuse, the coast of the province of Holland is composed of sand-down hillocks; that named Camperdown, celebrated for the victory gained by Admiral Duncan over the Dutch fleet, in 1797, is one of the most remarkable for its elevation, as well as for the rugged appearance of its southern part, which is covered with heath.

The alluvion of the Meuse and Scheld has formed a great number of low islands, in order to secure which from the inundations of these rivers and from the irruptions of the sea, it has been necessary to surround them with dikes of clay, strengthened on the inside by masonry and wood work, and covered on the outside by strong matting of flags, staked to the dike with wooden pegs. These dikes are many of them thirty feet higher than

than the land within them and their tops form roads admitting two carriages abreast; in their descent the breadth increases, so that it is not difficult to walk up and down their sides.* Holland.

The great rivers Rhine, Meuse, and Scheld, empty themselves into the British Sea through the territory of the United Provinces. The Rhine, which for the greater part of its course is one of the most considerable rivers of Europe, almost loses even its name in entering the Netherlands, where it divides into two great branches, the southern called the Waal, and the northern the Leck, and both falling into the Meuse. A small stream diverging from the Leck alone retains the name of Rhine, and after passing through Leyden is lost among the sands of the Dutch coast, near the village of Catwick.

The Meuse or Maes, after a tortuous course through France, empties itself among the Dutch islands by several channels. The northern, and principal one, passing by Rotterdam, is called the Merwe.

The Scheld (*Escaut*, French) also empties itself among the Dutch islands by two branches, called the East and West Scheld: the latter is also named the Hondt. The navigation of this river was long an object of contention between the Dutch and the Emperor, the former who commanded the channels refusing, in conformity with the treaty of

* The low grounds recovered from the sea, by thus enclosing, are called Polders.

Holland. of Munster in 1648, to admit any vessels to or from Antwerp. In 1784, however, its navigation was declared free.

From the entrance of the Scheld to Dunkirk, the coast is lined by dangerous shoals, called the Flemish Banks, and the shore is generally composed of sand downs, forty to fifty feet high, and from a mile to four miles broad, which continually encroach on the cultivated grounds within them. Attempts have latterly been made to arrest this progress, by sowing certain plants calculated to fix the sands.

Port Trust. Germany. Entering the Elbe and prolonging the left bank, the first place is Cuxhaven, a small, flourishing, and fortified town belonging to Hamburg. Stade, in the Duchy of Bremen on the Schwinge, four miles from its junction with the Elbe, is a fortified town of some trade.

Haarburg, in the territory of Luneburg on the Seeve, opposite Hamburg, is well fortified, with a castle and palace of the Duke of Luneburg. It exports a considerable quantity of timber.

On the right bank of the Weser, the only place of note below Bremen, is Carlsburg, at the mouth of the Geeste.

Bremen is a strong town on both sides of the Weser, sixteen leagues from the sea; it has 40,000 inhabitants, and was a free imperial city, next to Hamburg in the extent of its commerce, which was chiefly on commission. It had a considerable share in the northern whale fishery.

East Friesland. In the province of East Friezeland, appertaining to

to Prussia, are Norden, a town of 4,000 inhabitants, four miles from the sea, but with a port. Embden, on the Dollart, near the mouth of the Ems, has 10,000 inhabitants, and a good port for vessels of twelve feet draft, larger ones being obliged to lay in the road two miles from the town. While Prussia remained neutral in the maritime wars, Embden had a great trade, a vast amount of Dutch property being covered by the prostitution of the Prussian flag. It had also a considerable share in the herring fishery in the British Sea, and built many merchant vessels for sale. It has besides manufactures of worsted stockings, soap, leather, &c. Port Towns.

Pappenburg, though to be found in few maps, is a town of 3,000 inhabitants, situated among marshes, near the left bank of the Ems, with which it communicates by a canal. Between 1796 and 1800, it being considered neutral by the belligerents, an extensive trade was carried on under its flag from Holland and France to the Baltic.

Nearly all the towns and villages of Holland have a communication with the sea, either direct or by rivers or canals. It would be tiresome, and in a great measure useless, to attempt a minute description of all these places, which the persevering industry of the Dutch, overcoming natural difficulties, had raised to a degree of opulence to be met in no other country. We shall, therefore, confine ourselves to noticing those of most consideration for their commerce, accessibility to shipping, or other circumstances.

In

Port Towns. Groningen.

In the province of Groningen are Delfzyl, at the mouth of the Fivel or Damster Diep, which joins the Dollart: it is a strong fortress. Dam, on the same river, one league above Delfzyl, is a handsome open town. Stoltkam is a large fort at the mouth of the Hunse or Loopen Diep. GRONINGEN, on the Hunse, twenty miles above Stoltkam, is a regular handsome town of 20,000 inhabitants, with a palace of the Stadtholder. The largest ships ascend to it by the river, and it communicates by a canal with Delfzyl.

Friezeland.

In the province of Friezeland are Dockum, six miles from the mouth of the Ee, an antient town of 3,000 inhabitants who make a great quantity of salt. It communicates with Leuarden* and Groningen by canals. On the east shore of the Zuyder Zee, are Harlingen, a fortified town of 7,000 inhabitants: its harbour is of difficult access, and large vessels lie out in the channel called the Hiestrom. Workum, twelve miles south of Harlingen, is situated among lakes and has an incommodious port blocked with sands, but several canals branch from it. Hindlopen is a fishing town four miles S. of Workum. Staveren had formerly a good port, but which now admits only fishing boats.

Zuyder Zee.

Overyssel; Zuyder Zee.

In the province of Overyssel are Blockzyl, at the mouth of the Old Aa, with a good port. Wollenhoven, with a castle, and Swartsluys, at the confluence of the New Aa and Blackwater, are small

* Leuarden was formerly on a gulf, but which has been filled up by the depositions of the sea, and the ground cultivated.

small ports. Campen, at the mouth of the Yssel, has 6,000 inhabitants. The river is here crossed by a wooden bridge 723 feet long. Zwoll, at the confluence of a branch of the Aa with the Yssel, seven leagues above Campen, is a fortified town, with 10,000 inhabitants. It receives vessels from the sea by the river. On the adjacent mountain of St. Agnes was an Augustine convent, in which the pious Thomas à Kempis spent seventy-one years, until his death in 1471. A canal communicates between Zwoll and the Vecht. Port Towns. Guelderland; Zuyder Zee.

In the province of Guelderland are Harderwik, a town of 800 houses, with an university and some trade in corn and fish; and Elburg, 300 houses.

Amersfoort, in the province of Utrecht, on the river Eem, which falls into the Zuyder Zee, has a trade in beer and tobacco.

In South Holland is Naerden, a fortified town of 480 houses, famous for the cruelties exercised by the Duke of Alva in 1572; it has manufactures of cloth and velvet, and communicates by a canal with the small fortified town of Muyden, at the mouth of the Vecht, which has 200 houses, a castle, and some trade. A canal runs from it to Amsterdam. South Holland; Zuyder Zee.

Amsterdam, the chief city of the United Provinces, is situated at the mouth of the Amstel, which falls into the Y.* It is built over a marsh entirely

* The channel into the Y is called the Pampus; the Y is a branch of the Zuyder Zee, communicating with the lake of Haerlem by a lock, the waters of the lake being five feet higher than those of the Y.

Port Towns. entirely on piles, and intersected in every direction by canals, which render it unhealthy. It has no fresh water but what is preserved in cisterns from rain. It has 230,000 inhabitants, and is fortified towards the land by a broad ditch and a great number of bastions. Towards the water it is only protected by a double range of great piles, strengthened by transverse beams, with openings to admit vessels into the canals, which are closed by booms at night. Its chief security, however, consists in the facility of inundating the neighbouring country by means of sluices. Before the war, Amsterdam possessed three-fourths of the foreign trade of the United Provinces, and had 500 merchant vessels belonging to it.

North Holland; Zuyder Zee. Saardam, on the north shore of the Y, opposite Amsterdam, is a considerable town with extensive ship-building establishments for Amsterdam, in one of which Peter the Great of Russia worked as a common carpenter.

Monnikendam, opposite Marken Island, is a neat town of 2,000 inhabitants; its harbour is choaked with sand, but it has manufactures of silk and soap. Edam, a town of 4,000 inhabitants, at the mouth of the Ey, is celebrated for its cheese. Hoorn, so named from its port curving like a horn, has 9,000 inhabitants, a considerable share in the herring fishery, and exports a great deal of butter and cheese. Ships of war and merchant vessels are built here. Its fortifications are slight. A canal communicates from it to Alkmaer. Enkhuisen, a neat fortified town of 2,600 houses, has a good

a good harbour, and formerly sent 500 smacks to the herring fishery, but which of late years were reduced to sixty. A great quantity of salt is made here. Medenblik is a small town and old castle; it is a great dépôt for Norway and Swedish timber. Port Twisse.

Quitting the Zuyder Zee and prolonging the west and sandy shore of the peninsula of North Holland,* we first find the Helder, at the extremity of the peninsula on the Mars Diep. It is a considerable village with strong fortifications, which protect a road to the west, called the Land Diep, which is the usual rendezvous of the Dutch fleet. Kallantsloog, eight miles south of the Helder, Camp, Castricum, Egmont op Zee, Wyk op Zee, a little south of which are two lights. Landsoort, Nordwyk, and Catwyk, are fishing villages amongst the sand hills, whose church steeples serve as marks in sailing along shore. North Holland; British Sea.

The Hague (*Graaven hagen*) is seen from the sea, from which it is three miles distant. Though only considered as a village, it has 30,000 inhabitants, and was the residence of the court of the Stadtholder. It is surrounded by a canal six miles in circuit, planted with elms. Schevelling is a fishing village of 200 houses; and Gravesand another handsome village on the sand downs. South Holland.

Entering the Meuse, on the north shore we meet

* This peninsula is joined to South Holland by a narrow isthmus between the British Sea and a lake which communicates with the Zuyder Zee.

Port Towns. meet in succession with Naaldwyk, a handsome village, and a magnificent palace of the Prince of Orange, named Hondslaardyk, five leagues west of Rotterdam. Vlaardingen, a fishing town. Schiedam, at the mouth of the Schie, has 8,000 inhabitants, is celebrated for its gin, which employs 150 distilleries. Delfshaven, a market town of 1,400 inhabitants, at the entrance of the canal that goes up to Delft, and one mile below Rotterdam, sends many smacks to the herring fishery.

Rotterdam, the second city of the United Provinces, having between 50 and 60,000 inhabitants, is situated at the mouth of the Rotter, a small stream that falls into the Merwe or north channel of the Meuse. It is intersected by canals which receive the largest ships to the quays. Next to Amsterdam, it is the most commercial city of Holland, and its arsenal is one of the most complete in Europe.

Dort or Dortrecht, on an island in the Biesbosch, has 20,000 inhabitants, and a considerable trade in corn, Rhenish wines, and timber, which is floated down the Rhine, and cut by numerous saw-mills in the neighbourhood.

Briel, or the Brill, on the north side of Voorn-land Island, is well fortified, has 4,000 inhabitants, chiefly fishermen and pilots, and is noted as being the first town that joined the union in 1572. Helvoetsluys, on the south side of Voornland is an inconsiderable place, but contains the naval arsenal of Rotterdam, its port being the only one of the United Provinces that can receive ninety-

gun

gun ships without camels. In peace two packets sail every week between it and Harwich. Part Twenty

Gertruydenberg, at the S.E. extremity of the Biesbosch and on the river Dungen, is an important fortress, with a little town of 1,800 inhabitants. Williamstadt, in Dutch Brabant, on Klundert Island, and on the channel into the Biesbosch, called Holland's Diep, is also a strong fortress, with a village of 400 inhabitants.

The province of Zealand is composed of the islands formed by the Meuse and Scheld, and has two divisions, the eastern one containing Goree, Overflackie, Schonen, Duiveland, Tholen, Philipsland, and some others. Goree is the first land usually made by vessels bound to Rotterdam: it has only a village. Schonen is five leagues long, its chief place is Zierik Zee, on the south, an antient trading town of 6,000 inhabitants. Browershaven, on the north, has 1,000 inhabitants, and a tolerable harbour; and Hamstead, on the west, is a large handsome village. Duiveland has no town, but several large villages. Tholen has a small fortified town of the same name. St. Philipsland only villages. Zommerdyk is the principal place of Overflackie, on the north coast. Zealand.

The west division contains Walcheren, North and South Beveland, Wolfersdike, and Juisteland, with some other lands. Walcheren, including Juisteland, which is separated from it by a very narrow channel, is the most fertile and populous of the Zealand islands. Middleburg, the capital of the province, has 1,600 inhabitants, and communicates

Port Towns. Zealand.

with Flushing by a canal fit for large vessels. Flushing, (*Vlissingen*) on the south end of Walcheren, has 10,000 inhabitants, and a beautiful port within two moles, capable of holding eighty sail of the line, besides extensive docks and basins. It is strongly fortified, and commands the West Scheld or Hondt. Terveer, on the east, has a good port and marine arsenal. Armuyden, on the east point, had formerly a port, but it is now choaked.

South Beveland, the largest of the Zealand islands, is eight leagues long and two to three broad. Goes, on the north, is the chief place, and is a neat town with a harbour for small vessels. North Beveland is six miles long and four broad; it has the little town of Korting.

Dutch Flanders.

In Dutch Flanders are Cadsand, on the west end of the island of the same name, separated from the main land by the channel called the Swin; Ysandik, a fortress and village of 160 houses; Biervliet, an insignificant place on an island near the south shore of the Hondt; Terneuse, on the same shore, a small fortified town almost surrounded by water at high tides. Sluys (*Ecluse*, French), on the Swin, opposite Cadsand, is a small fortified town of 1,500 inhabitants; its port, which was formerly deep, can now only receive small craft.

Austrian Flanders.

In Austrian Flanders are ANTWERP (*Anvers*, French) on the Scheld; it is one of the handsomest cities of Europe, and has 56,000 inhabitants. Its port, which was vastly improved by the French, is capable

capable of receiving seventy-four gun ships. The city is intersected by eight canals, and besides other strong fortifications has a regular citadel, and the whole country may be laid under water by sluices. It was antiently one of the most commercial cities of Europe, but ceded to its rival Amsterdam, and its remaining commerce was annihilated by the closing of the Scheld; but when this river was again opened in 1784, its trade revived, fifty vessels entering from sea in 1800, and 142 in 1801. It communicates with Brussels by a canal. *Port Towns. Austrian Flanders.*

On the sea coast of Austrian Flanders are Blankenburg, a fishing town on the sand beach. Ostend, a celebrated commercial town of 10,000 inhabitants. Its haven is formed by two jetties of wood, enclosing rough stones; it can receive vessels of twenty-one feet at high water, there being a bank before the entrance with but six feet at low ebb, but inside is four fathoms at low water. On the left of the entrance is an elevated column with a lanthorn. Ostend being declared a free port in 1781, a vast trade was carried on from it till the end of the American war, by the French and Dutch, under the Imperial flag. Several canals, navigated by vessels of 200 tons, communicate between Ostend, Furnes, Bruges, Nieuport, Dunkirk, &c.

Middlekirk, two leagues west of Ostend and Nieuport, on the Yperlee, are fishing villages: the former is protected by a fort, and the latter has a dry tide haven, with thirteen feet at high water.

Commerce.

We have already noticed, in treating of the commerce of the Baltic, that the regular system of commercial exchanges which originated in the south gradually spread itself towards the north, where free fairs were established, in imitation of those of the Italian States, about the tenth century. Amongst the trading cities Gand (Ghent) first took the lead, but was soon surpassed by Bruges, which in its turn ceded to Antwerp, in whose port, in the fifteenth century, 2,500 vessels were seen at one time.

Tenth Century.

Fifteenth Century.

A. D. 1568.

Charles V., when he united the seventeen provinces of the Netherlands to the crown of Spain, respected their antient privileges, and in return they contributed largely to the splendour of his reign. His son, Philip II., blinded by the spirit of despotism, pretending to govern these provinces as arbitrarily as Spain, irritated the Flemings to resistance; and this resistance, which was considered as rebellion, combined with religious fanaticism, called down on them every species of oppression and persecution from the monarch and his viceroys, until the country, before so happy, became a scene of horror and desolation. At length driven to desperation, seven of the provinces openly revolted, and declared their independence, under the name of the Republic of the Seven United Provinces.

1568.

Before the revolution these provinces were amongst the poorest of the Netherlands, but no sooner had they proclaimed themselves free than their situation rapidly improved. Rich citizens;

and

and skilful and industrious manufacturers, flocked to them from the other provinces, either to escape from political vexation or religious persecution, or to seek that liberty and equality which can only exist in the infancy of a virtuous commonwealth. Amsterdam became the rival of Antwerp, and soon outstripped her in the career of commerce. Commerce.

The temperate and liberal form of the government, and the equity and prudence of the magistrates, founded and increased the prosperity and grandeur of the new republic, and enabled it to support, and to terminate successfully, the struggle for its liberties, against the most powerful monarchy in Europe, and afterwards to measure its strength with a balanced success against England. During these wars, Holland did not cease to extend her commerce, on account of which they were partly undertaken, and which, by a reaction, principally enabled her to carry them on: but the territory of the republic affording few commercial objects, it was necessary to seek for them abroad; and they were found in the fisheries, and in the East and West Indies and carrying trades. A. D. 1600.

The herring fishery, which was long called, with propriety, the gold mine of Holland, was carried on, on the coasts of the Low Countries, in the twelfth century; but the art of curing and barrelling these fish was first invented by Beukelz, of Biervliet, in 1316. Fisheries.

In 1402, this fishery received its first grand extension after the terrible inundation, which having destroyed

Commerce. Fisheries.

destroyed a great part of South Holland, and reduced the inhabitants, who escaped, to indigence, they sought a resource from the element that had caused their misfortune; and at this epoch, the buss, or buyss, was substituted for the boats called slabbarts.

The republic afforded the fishery every encouragement, and left nothing untried to secure its monopoly, in which it for a time succeeded. In 1610, 3,000 busses, and 50,000 fishermen, were employed in it, besides 9,000 boats and 150,000 persons occupied in transporting, curing, and selling the fish, which then brought into the country upwards of two millions and a half sterling.

In the middle of the eighteenth century, the fishery was at its height, and employed 100,000 fishermen. At length the other nations, whose coasts were visited by these fish, opening their eyes to their interest, determined to share in this common mine, and the consequent concurrence reduced the profits of the Dutch to the one-sixth of their original amount. In 1780 the number of vessels were reduced to 200, of twenty to thirty tons each, manned by fourteen persons, and which made two or three trips a year. The fishery commenced at the north extremity of Great Britain on Midsummer day, and descended progressively later towards the south, till it ended in November on the coast of Holland. A considerable quantity of herrings are also taken in the Zuyder Zee, and chiefly smoked. The chief

chief rendezvous of the herring busses are Rotterdam, Dort, Delfshaven, Schiedam, Vlaardingen, the Brill, and Enkhuyzen. The Dutch had also about 100 vessels employed in the cod fishery on the coast of Iceland; the produce of which was salted, and consumed principally in Holland and the neighbouring countries. Commerce. Fisheries.

On the decline of the herring fishery, the Hollanders, never at a loss for the profitable occupation of their capital, turned a part of it into the more distant and precarious northern whale fishery, which soon became a second mine of wealth, and one of the most important branches of maritime industry. In the beginning of the seventeenth century, societies were first formed in Holland to carry on this fishery; and the crews of the vessels were composed of Basques, the only people of Europe then acquainted with the manner of fishing. Every encouragement being afforded by the States General, the whale fishery continued to flourish until the grand convulsion of Europe, produced by the French revolution. The vessels employed in it were from 100 to 160 lasts burthen, with forty men. The following statement will afford an idea of the variation of the fishery.—

Years.

Commerce. Fisheries.

Years.	Ships returned from the Greenland seas.	Fish.	Ships returned from Davis's Strait.	Fish.
1683	242	1349		
1691	2			
1694	63	164		
1700	173	907		
1710	137	62		
1714	108	1234		
1719	182	302	29	43
1729	93	113	90	198
1739	133	678	58	51
1749	114	412	41	206
1759	133	427	22	39
1769	111	972	42	155
1779	59	126	46	36

The price of whale oil in the markets of Holland increased from twenty-three florins the barrel in 1683, to eighty florins in 1780.

Colonies. While the Hollanders were still combating for their independence, they continued to carry on their ancient commerce under the protection of their ships of war; and in particular supplied the people of the north with the productions of India, which they procured from Lisbon. But this port being closed against them on the union of Portugal to Spain, they determined to seek their objects A. D. 1595. in their proper country; and the Indian seas saw the Dutch flag floating in competition with that of Portugal, and after a long and bloody struggle, almost excluding the latter from these regions. And although the English shortly presented themselves

selves as a still more formidable rival, and the French, Danes, and Swedes, at later periods, entered into concurrence, nevertheless the Hollanders, by their prudence and economy, maintained their Indian settlements and commerce in a state of great prosperity, until the events which threw Holland into the paternal arms of France, when her colonies in both worlds were taken possession of by England. Those in the Indian seas were the Cape of Good Hope, the island of Ceylon; factories at Cochin, Cannenore, Quilon and Surat on the West coast of India; Negapatam and Pulicat on the coast of Coromandel; a factory at Hugley in Bengal, the supremacy of the island of Java, settlements in Sumatra and Celebes, the fortress of Malacca, the island of Amboyna and its dependencies, the Banda islands, several of the Moluccas, and the domination of nearly all establishments on Timor and other Malay islands, a factory at Canton in China, and at Gombroon on the Persian gulf. By the treaty of Amiens, the island of Ceylon and Malacca were retained by England; and by the recent one of Paris the Cape of Good Hope remains to her. Commerce. Colonies.

The republic was not yet established in its independence, when it began to turn its views towards the new world, and in 1621 a West-India Company was chartered, which fitted out powerful fleets both for war and commerce. In the prosecution of the former, the Portuguese were dispossessed of the greater part of Brasil, and the captures made from them and the Spaniards,

Commerce. Colonies.

niards immensely enriched the company. At the same time, this association formed establishments on the west coast of Africa, to supply the colonies with slaves. With the termination of the war, the affairs of the company declined, and a false economy leading them to withdraw their troops from Brasil, the Portuguese taking advantage of its defenceless state, repossessed themselves of it when least expected. In 1674 the company was dissolved and a new one created, which existed till the union with France.

The Dutch West-India islands, though of little consequence as agricultural colonies, were from particular circumstances of great consideration to the national trade. The general neutrality of Holland, in the wars between France, Spain, and England, caused the otherwise insignificant islands of Curaçoa and St. Eustatia to become the general dépôts of the produce of the French and Spanish West-Indies, from whence it was shipped under the Dutch flag for Europe. In peace, a contraband trade with the Spanish settlements on the main continued to enrich these islands, St. Eustatia sending twenty to thirty cargoes, and Curaçoa ten to twelve a year to Holland. Of the Dutch colonies on the continent of America, Surinam alone was of consequence; in 1775 it exported to Holland 20,000 barrels of sugar, 20 millions pounds of coffee, 700,000 lbs. of cocoa, and 144,000 lbs. of cotton. Besides other objects, the Dutch settlements on the west coast of Africa supplied about 12,000 slaves a year.

At

At the epoch of the independence of the United Provinces, the marines of the other northern nations being still in their infancy, they were dependent on foreigners for vessels to carry on their trade, and the Hanse association, as we have already seen, had long monopolised this branch of commerce, but which was at length wrested from it by the Dutch, who, become the grand carriers of Europe, thence derived immense profits without any proportionate risk. This source of their riches, however, like all others, diminished with the progress of improvement. The English first discovered that they could, and ought to do, without the intervention of strangers in their commerce, and the famous navigation act passed in the protectorate of Cromwell, at once shut out the Dutch carriers from their ports. This example being followed by the nations of the north, the Dutch carrying trade was reduced to comparative insignificance. Commerce. Carrying trade.

But though the fisheries and the carrying trade of Holland had ceased to be what they were, she still possessed commercial resources, that continued her in the first rank of trading nations. The monopoly of the spices of Ceylon and the Moluccas, and the other trade of the East and West-Indies, created vast capitals, a considerable part of which was employed in advantageous loans to foreign nations, and another portion in the commerce of transit or commission; for Holland, from its central situation, being calculated for the emporium of the north and south, where the

Commerce. Carrying trade.

the people of each can exchange their respective productions more advantageously than by conveying them to the ports of each other, it naturally resulted that the Dutch should become the brokers of Europe.

The United Provinces possess the greatest natural facilities for carrying on a great maritime and internal commerce, for while almost every part is accessible from the sea, they have the advantage of possessing the Meuse and the Scheld, whose waters are distributed amongst innumerable creeks, intersecting the country and united by canals, forming the most extensive inland navigation of Europe. The territorial productions of the provinces for external commerce are of minor consequence, being confined to wine, wheat, flax, wax, butter, cheese, and madder; nor are the manufactured objects of much greater moment, the price of labour preventing their extension. They are small quantities of silks, woollens, cottons, linens, and papers; besides refined sugar, tobacco, snuff, linseed oil, toys, &c.

The documents we have been able to procure afford the following statement of the number of vessels employed by Holland, in the various routes of trade in 1780.

In the Baltic trade..... ...	2,500
To Norway and the White Sea, and to the ports of Germany on the British Sea	900
To the ports of France, Spain, and Portugal, on the Ocean....	7 to 800

To

To the Mediterranean	150
To the East-Indies.....	14
To the West-Indies and America	150
To the Greenland Seas	120

The trade of the United Provinces on the rivers and canals, forms a considerable branch of the general commerce, and is the only one not annihilated by the war. One of the most extensive and profitable branches of this internal trade is that of timber, vast rafts of which are floated down the Rhine from the forests of Germany to Dordrecht. Some of these floats are 700 to 1,000 feet long, and 50 to 100 broad, and each has a village of wooden huts for the conductors, who sometimes amount to 500 persons.

The navy of Holland has continued to decline since the seventeenth century, when it was able to cope with those of the most powerful nations of Europe. In 1784 it consisted of forty ships of from fifty to seventy guns, forty-three frigates from twenty-four to forty, and eleven sloops from twelve to twenty. During the recent wars it dwindled away, both by neglect and by the losses it sustained from the English, so that on the union with France it did not consist of above seven or eight ships of the line and a few frigates.

NOTES TO VOL. I.

(A)—Page 19.

Though it is impossible to cut through the mountains that compose the Isthmus of Darien, a navigable communication between the two seas might be effected at three different points without any very great difficulty. 1. By the river Chagre which empties itself into the gulf of Mexico, and is navigable to within five leagues of Panama. 2. By the river St. Juan and the lake Nicaragua, the latter being only separated from the Pacific by a low tract, 14,000 fathoms broad. 3. By the junction of the rivers Chamaluzen and St. Michael, the former of which empties itself into the bay of Honduras, and the latter into the Pacific.

(B)—Page 20.

The following observations, the result of experience, with respect to elevated shores, may not be useless to some of our naval readers. 1. The wind, however violent at sea, seldom blows home to high steep shores, but moderates on approaching them, and generally changes the direction several points blowing obliquely or parallel to the coast, so that at the moment when there seems to be no possibility of keeping a vessel from driving on shore she is enabled to lay off. 2. Where a high steep shore is exposed to the sea, though the waves break violently against it there is almost always a reaction in the inferior waters, which in a degree counteracts the effects of the waves in impelling a ship towards the shore.

(C)—Page 21.

The analysis of three pounds of water taken up near Aurich in East Friezeland (British sea) and the same quantity from near Rostock in the Baltic gave

	Brit. Sea.	Baltic.
Muriat of soda, or common salt grains	522	268
Muriat of magnesia, or Epsom salt	198½	111
Sulphate of lime, or selenite	23	12
Sulphate of soda, or Glauber salt	1⅓	1
Residue	1½	1
	746⅓	388

(D)—Page 22.

The following series of observations offer considerable differences in the degrees of saltness in nearly the same places.

From Bergman's Physical Geography.

Near Iceland, of its weight..... 1/10 to 1/12
Near the S. coast of Norway..... 1/10 1/7
In the Cattegat..... 1/12
In the Baltic..... 1/16
In the gulf of Bothnia. 1/40 to 1/30
In the British sea, on the coast of Holland..... 1/32
———, on the coast of Northumberland 1/30
———, off the North Foreland..... 1/29
In the English Channel.... 1/30
In the Irish Channel off the coast of Cumberland.... 1/40
In the Atlantic near the coast of France..... 1/32
——— near the coast of Spain..... 1/16
In the Mediterranean near Castiglione..... 1/21
Five miles N. of Malta,... 1/27

From De Pages' Voyage round the World.

In lat. 81° N. among the ice 1/25
74 no ice..... 1/21
64 between Iceland and Norway... 1/25
59 between Zetland and Norway... 1/28
In the Atlantic 45° N.... 1/25
39..... 1/25
26..... 1/26
10..... 1/27
4½..... 1/28
1½ S..... 1/28
On the Equator..... 1/26
20½ S..... 1/25
26..... 1/25
In the Gt. S. Ocean 40½..... 1/25
46..... 1/25
50..... 1/24

(E)—Page 22.

In the Mediterranean the difference of the degrees of saltness between the surface and the bottom has been found to be as 32° to 29°. In the channel of Constantinople as 72° to 62°; and between the Cape de Verd Islands and the Equator Captain Cook found the difference between the surface and the depth of sixty fathoms to be as 100 to 86.

(F)—Page 24.

In the narrative of the voyage of Le Maire these insects are described as "horned lice, white as christal, and marked on the head with a spot the colour of fire." Cowley, in his voyage to the Grand Ocean, describes this appearance as proceeding from "a multitude of shrimps." Funnel, navigating also in the Grand Ocean, relates, that on taking up a bucket of water thus coloured, "it was found to contain a vast quantity of viscous globules of a red colour, which floated on the surface and which he concluded to be the spawn of fishes." Captain Cook, whose observations are most to be depended on, in his third voyage, found that the same appearance proceeded from "an infinity of little animals, which being viewed through a microscope had the shape of cray-fish of a red colour."

(G)—Page 25.

The following are the results of experiments made on luminous sea animals by Mr. Macartney and published in the Phil. Tran. "The property of admitting light is confined to animals of the simplest organization, the greater number of which are inhabitants of the sea. The luminous property is not constant, but in general only exists at certain periods and in particular states of the animal's body. The power of shewing light resides in a particular substance, or fluid, which is sometimes situated in a particular organ, and at other times diffused throughout the animal's body. The light is differently regulated when the luminous matter exists in the living body, and when it is abstracted from it: in the first case it is intermitting or alternated with periods of darkness, is commonly produced or increased by a muscular exertion, and is sometimes

absolutely dependant on the will of the animal. In the second case the luminous appearance is usually permanent until it becomes extinct, after which it may be restored directly by friction, concussion, and the application of warmth, which last causes operate on the luminous matter (while in the living body) only indirectly by exciting the animal. The luminous matter in all situations, so far from possessing phosphoric properties is incombustible, and loses the property of emitting light, by being dried or much heated. The exhibition of light, however long it may be continued, causes no diminution of the bulk of the luminous matter. It does not require the presence of pure air, and is not extinguished by other gasses. The luminous appearance of living animals is not exhausted by long continuance or frequent repetition, nor accumulated by exposure to natural light; it is, therefore, not dependant on any foreign source, but inheres as a property in a peculiarly organized animal substance or fluid, and is regulated by the same laws which govern all the other functions of living beings." Mr. Macartney concludes with observing that the light of the sea is *always* produced by living animals and most frequently by the Medusa scintillans.

(H.)—Page 26.

The constant internal heat of the earth, which appears to be never less than 86°, is always in our climate above 40°, and never exceeds 54°, was ascribed by Buffon and his followers to a central fire; but more recent naturalists consider it as the result of the heat which the earth has acquired by the continual absorption of the sun's rays during the lapse of ages. The following observations prove that the relative temperament of the air and the sea at different depths vary with the season, locality, &c.

Place.	Lat.	Month.	Atmos.	Surface.	Depth. fath.	Temperat.
Frozen ocean...	80°	Aug.	32°	36°	60 under the ice	39°
	67	June	48½		780	26
North Atlantic..	65	Sept.	66½	55	683	40
	57½	Jan.	46	37	1	40
	55½		47	40	18	51
	39½		53	59	18	59
	10		78	79	70	66
	3	Feb.	81	84½	18	81
	0	Sept.	75½	74	85	66
S. Atlantic....	24	Sept.	75½	74	50	66
	24½	Aug.	72½	70	80	68
Grand Ocean ..	58½	Dec.	31	32	160	33½
Off Cape Horn				38	100	35½
North Tropic				78	21	76
					50	71
					125	62
Equator				82	100	69
Near the land in the G. of Bothnia		July	68°	65		
		Oct.	39	46		
In the Sound		Aug.	70	68	3	66
At Bermudas		May	80	78		

(I)—Page 26.

It appears however that sea-water requires a certain continuance of the process of congelation to get entirely rid of its salt. In the Frozen Ocean De Pages found that the ice formed under his eye round the ship, when the thermometer was 5¼° below the freezing point, still contained the $\frac{1}{100}$ part of salt; that the same ice exposed for eight days to a cold of 2½° to 4½° below the same point, contained but $\frac{1}{400}$; and that at the end of three weeks, the thermometer for the last six days varying between 13½° and 24½° below, the salt was entirely expelled. Mr. Nairne found that, with a cold of only 27½°, or 5° below the freezing point, the fresh molecules of the sea water froze, leaving a residue of liquid extremely salt. This natural process is taken advantage of in certain parts of Scotland to fabricate

common salt. In winter the sea water is exposed in shallow reservoirs to the freezing atmosphere, which forms a crust of fresh ice on the surface, which is taken off; and this process twice or thrice renewed, leaves a residue of brine which is converted into salt by fire.

(K)—Page 27.

The ice lands, formed in the bays and rivers of America, and conveyed to the sea by currents, are of much greater elevation than those formed on the ocean. Denis, the French governor of Canada, says, that those which drift to the Bank of Newfoundland have been sometimes ten leagues in circumference, and that they ground in thirty-five fathoms; and Ellis, in his voyage to Hudson's Bay, assures us, that some of them are elevated from 1,500 to 1,800 feet above the level of the water. De Pages supposes these mountains to be formed of many pieces united by compression; that these pieces, accumulating in the narrow parts of the rivers or gulfs, are arrested, and that other pieces, carried forwards by impetuous currents, are forced underneath the first, and thus successively until the formation of these mountains.

(L)—Page 29.

Astronomers generally attributed the superior cold of the southern hemisphere, to the sun's being seven days and eighteen hours less in the southern than in the northern signs; but the difference produced by this cause ought not to exceed the $\frac{1}{25}$, while the real difference appears to be $\frac{1}{4}$. The theory of the rays of heat has afforded another explanation in the attempt to demonstrate, that in a given time the southern hemisphere loses a greater proportion of its constant proper heat than the northern: but this cause ought not to cease suddenly, between the thirty-fifth and fortieth degree of latitude, as is observed to be the case.

(M)—Page 31.

Geometricians have attempted to calculate the velocity of the propagation of waves, which according to them will be the same as that which a heavy body acquires in descending from a height,

height, equal to half the depth of water in the channel; consequently, if the depth is one foot, the velocity of the wave will be 5 $\frac{951}{1000}$ feet per second of time, and as the depth is greater or less, the velocity will vary in a ratio underdoubled of the depths, provided they are not too great.—*La Grange, Mécanique Analytique.*

(N)—Page 40.

It seems proper to observe, that this method of reckoning the time of high water by the compass, is liable to great errors. Thus for instance, it is said, the tide flows east and west, or six hours at Plymouth; but if it was thence understood, that the moon is always east or west when it is high water there at full and change very dangerous consequences might result, for when the moon has a high northern declination, it may happen that she will not bear due east till near eight o'clock in the morning at Plymouth, which will be about two hours after high water, and on the same day she will bear due west soon after four o'clock in the afternoon, or nearly two hours before high water. The best rule would be to say, it is high water so many hours after the moon has passed the meridian.

(O)—Page 47.

Though the Caspian Sea may be considered as an immense lake, it deserves notice in a system of maritime geography, as well from the saltness of its waters as from its once probably having had a communication with the ocean. It is about 300 leagues in length and 100 broad. Its general depth is sixty to seventy fathoms, though towards the southern extremity 380 fathoms of line have not reached the bottom; while towards the shores it is so shoal, that small vessels only can approach them, and besides its navigation is rendered dangerous by rocks, shoals, and frequent storms It is subject to irregular elevations of four to eight feet, which seem to be produced more by the unequal pressure of the atmosphere, than by the fluvial waters it receives. According to modern travellers, its surface

surface is lower than that of the Black Sea by fifty or sixty feet.

The error of almost all the antients, who considered the Caspian Sea as a gulf of the Northern Ocean, was first refuted by Ptolemy, who placed it in his geography as a great lake without any communication with the Ocean or other seas. Modern writers have supposed an antient communication between the Caspian and the Sea of Azoph, and support this opinion, by the fact that the middle and eastern part of the plain that separates these seas, is composed of sand impregnated with salt, and mixed with the remains of shells, similar to those found in the Caspian; hence they suppose, this plain to have been antiently covered with water. This idea is however unsupported by any historical or even traditional authority, and therefore, allowing this communication, it must have ceased to exist in the most early times.

Others have pretended that a subterraneous communication exists between the Caspian and the Gulf of Persia, and chiefly found this idea on the leaves of the willow being often found floating in the gulf, though this tree is unknown on its shores; they therefore bring these leaves from the Province of Ghilan through an abyss, whose mouth is a whirlpool in the Caspian Sea near Asterabad, in the province of Mazendaran. It is, however, objected that these leaves may be brought down by the Euphrates, and, moreover, that if such a communication existed, sea-fish and sea-shells, similar to those of the Gulf of Persia, would doubtless be found in the Caspian, which is not the case. But it may be asked, supposing no communication with the Ocean, what becomes of the waters of the large rivers that fall into the Caspian. According to Halley, there is an exact compensation between the quantum of these waters and the amount of evaporation, which from the general shoalness of the sea is extremely great. A recent geographer adds the probable suggestion of absorption, by the calcareous mountains which bound the sea towards the S. and S.E. and which are penetrated with humidity and abounding in springs.

With

(P)—Page 48.

With respect to Mediterranean Seas, properly so called, as that which separates Europe and Africa, the Baltic, the Red Sea, Persian Gulf, &c. naturalists ascribe their formation to two different causes. Those from which a current continually runs out, as the Baltic and Black Sea, are thought to owe their origin to rivers, the waters of which collecting in a primitive plain or valley first formed a lake, the level of which continually rising by the accumulation of its waters, would at last surmount the barriers that separated it from the Ocean or from other plains, and a current thus once formed, would in the succession of ages scoop out the channels as we find them. The Mediterraneans which receive the waters of the Ocean, by a current inwards or by tides, as the Mediterranean proper and the Red Sea, are supposed to have been formed by irruptions of the ocean, caused either by the sudden sinking of the barriers that enclosed a valley below the level of the sea, or by the violent efforts of the sea against these barriers, in long continued tempests, &c. These are, however, but mere suppositions destitute of any historical authority, and most naturalists of the present day, consider these Mediterraneans as indebted for their formation to the last grand catastrophe, that brought our continents out of the waters. See the respective Mediterranean Seas, where these ideas are more fully developed.

(Q)—Page 56.

The various theories of the earth, both antient and modern, have for their basis either water or fire; the favourers of the former are called Neptunists, and of the latter Vulcanists. According to the Neptunists, the earth was at the beginning in a state of aqueous and cold dissolution, at least to a certain depth; the solid parts were formed by dessication, precipitation, christalization, &c. a great part of the primordial waters retired or disappeared, and the matters left dry, sinking, according to their respective specific gravities, formed vallies and mountains; the tertiary soils are composed of the depositions of the sea in the course of ages.

The

The Vulcanists hold that the earth was originally in a state of igneous fusion; that it gradually cooled, and was not covered with water till after its refrigeration; that the forces which gave it its present appearance were fire and air; that the continents were raised above the waters by an internal power; that the mountains were formed by volcanic eruptions, and that the tertiary soils are composed of the particles of the elevations separated from them by the elements.

Several naturalists of the present day seem inclined to combine the neptunian and volcanic systems, and from this combination Deluc has produced a theory, which though warmly combated, seems in its general principles to have united a majority of suffrages. He supposes that the earth was a chaotic mass of elements, in which the Divine Will, by infusing into them a certain quantity of light, gave birth to chimical precipitations, by which was formed a crust of solid rock. This crust sunk several times, and the edges of its fragments resting on the partitions of the internal caverns formed mountains, at the same time, that the waters which primordially covered the entire planet, filtered into the central parts, where the original chaos still subsisted; then appeared the first continents suspended over immense caverns; the sun had not yet lighted them when they began to produce vegetables, different from the present ones, and whose remains form our beds of coal. The present continents then forming the bed of the ocean, were covered with shells and remains of sea-animals, while submarine volcanoes spread over them beds of lava and formed mountains under the waters. By a great and last convulsion the primitive continents sunk into the internal caverns, and produced the universal deluge recorded by Moses. Then appeared above the water our actual continents, in whose soil are found buried the remains of the quadrupeds which had inhabited the antedeluvian islands, and of cetaceous animals. The preservation of these remains, which are found almost entire in cold countries, and the little thickness of the superficial soil of our continents, concur in proving that their antiquity,

or

or to speak more correctly, their appearance above the waters, is comparatively of a recent date.

The shells and other remains of sea animals found on the highest elevations of the globe, long divided naturalists; some considering them merely as a play of nature not to be accounted for, while the far greater number referred them to the Mosaic deluge. Palissy, so early as the close of the sixteenth century, first attempted to refute these ideas, and emitted the opinion now generally adopted, that these remains are too abundant to have been conveyed to the places where they are found, by a sudden and short irruption of the ocean, such as that described in the Mosaic account of the deluge.

(R)—Page 59.

Two facts entirely contradict the idea of this weed having ever adhered to the rocks, or having come from the Gulf of Florida; 1st. if it was brought by the gulf stream, it would be met with in the gulf, and throughout the whole extent of its current; 2dly. if it had ever adhered to the rocks, it would retain the roots or filaments by which it was attached; neither of which is the case. Some of the plants of this weed are several feet in diameter, while others are only a few inches. From the principal stem a number of branches with small leaves proceed, and adhering to the stems of these branches are little hollow berries filled with wind, the size of a swan-shot, sometimes green, at others red, probably according to the different degrees of maturity. When taken out of the sea and left to dry, the plant withers and becomes black in twenty-four hours; it also withers in fresh water, but in a longer time. A variety of aquatic insects and worms, both naked and crustaceous, inhabit among these plants; particularly a very beautiful crab, not above a quarter of an inch in diameter.—*Barrow's Voyage.*

Several species of sea and rock weed are eaten, such are in England the *fucus sacharinus, fucus palmatus,* handed fucus, the ulva, called wales laver, &c. The most common uses, however, to which they are put in Europe, are either as manure for the ground,

ground, or to burn into kelp for the manufacture of soap and glass.

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Corals were first classed among minerals, and afterwards considered as vegetables, until Peyssonnel, a French naturalist, discovered that they owe their formation to living animals, who elevate these habitations from the bottom of the ocean towards the surface, making use of a kind of lime and an animal gluten, supposed to be contained in their bodies. The different appearances of these substances evidently prove them to be formed by different species of animals, and have acquired them the names of millepores, cellepores, tubepores, &c.

Coral reefs are the foundation of future islands; for as the reef approaches the surface, the sea washes up and deposits on it the fragments of corals, shells, sand, &c. till dry spots are formed, to which the birds and the waves convey the seeds of plants, and vegetation once commenced, the decomposition of vegetables, and the dung of birds, by degrees create a soil capable of producing the most luxurious fruits of the tropics. Many of these coral islands, though covered with verdure, are however uninhabitable from the total want of fresh water.

From the continual growth of coral, a period might be supposed when all the neighbouring groups in the respective oceans would be united; but this union seems to be prevented by the winds, waves, and currents, which constantly acting on one side of the islands, wears it away, conveying the particles to the opposite or lee side, where the dead water permitting them to form a deposition, they create the banks of sand on which ships can anchor, there being scarcely ever any anchorage on the weather sides of coral islands, the shores falling perpendicularly into the abysses of the ocean. We have no series of observations from which to form a precise estimate of the growth of coral reefs towards the surface, but it appears certain that the depths over several of those in the China Sea have decreased two or three fathoms in the last fifty years. The most unaccountable circumstance respecting this substance is its being found in a perfect state

state at considerable elevations above the present level of the sea, particularly at King George's Sound on the S.W. coast of New Holland, and at Eooa, one of the Friendly Islands. See the voyages of Cook and Vancouver.

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The annual migration of herrings from the Northern Frozen Ocean, which was long received as an incontrovertible fact, and their route as accurately traced as that of an army, has been called in doubt by the naturalists of the present day, who think that, during their absence from the coasts, they only retire into the depths of the Atlantic, where they remain concealed until the period again approaches for them to deposit their spawn, for which purpose they seek the shoal water near the shores, where the temperature is greater, and the nourishment for their young more abundant. According to the opinion of their emigration, they were said to quit the Frozen Ocean about the middle of winter in three divisions; the first skirts the coasts of America as far as Carolina; the second, less considerable, passes through Behring's Strait, and prolongs the coast of Asia to Japan; the third, and by far the largest division, arrives at Iceland the beginning of March, where it subdivides into columns, or shoals, five or six miles long, and three or four broad. In April and May the advanced guard reaches the Zetland Islands, and the main body in June; towards the end of which, and throughout July, they are in their greatest perfection. From Zetland one column takes its course down the British Sea, and arrives off Yarmouth in October; while a second column, steering more westerly, enters the Irish Channel, and reaches the Isle of Man in July. After October, a few stragglers only are seen in our seas; and it is supposed that those which escape the net regain the Polar Sea.

Though we cannot ascertain the exact epoch when the herring fishery in the northern seas became a branch of established national industry amongst the people of their coasts, it is recorded by history, that it was carried on by the inhabitants of Zierick Zee in 1136, and in the Sound in 1468. The Yarmouth herring

herring fishery is noticed in 1283; and in 1285 Edward I. granted permission to the Zealanders, Hollanders, and Friezelanders, to take herrings on the coast of Norfolk. In 1389, in the months of September and October, Philip de Mezieres says, that there crowded such vast shoals of herrings into the Sound, that for many leagues they might be cut with a sword, and that 40,000 boats, with six to ten men each, were employed during these two months in the fishery, besides 900 large vessels, in which the herrings taken by the boats were salted.

The mackarel is also supposed to be a migratory fish, whose winter residence is the Frozen Ocean; which it is thought to quit the beginning of spring, and to pass successively along the coasts into the Mediterranean. A division of the grand column enters the English Channel from the Atlantic in May and June, passes through the Strait of Dover into the British Sea, and arrives at the north extremity of Jutland in July, from whence a subdivision enters the Baltic, and the rest prolonging the coast of Norway regain the Frozen Ocean.

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The dolphin of English seamen (*coryphenus hippuris*) has the following prominent characters: only one dorsal fin, very long, and with twenty-four rays, of which the eleven foremost are stiff and sharp; the pectorals are long, terminate in acute angles, and have each sixteen rays; the ventrals six rays, of which the first is stiff and sharp; the anal fin fourteen rays, the three first are sharp; the tail fin long and forked, with seventeen rays; the iris of the eye silver, with some dark spots; the jaws furnished with an outer row of oblong teeth, six in the upper, and eight in the under, within which are boney tubercles studded with points. Its scales are of middling size, and of various colours. Out of the water it has the back a blackish blue, the sides silvery, and the belly milk white. In the water its colours are extremely brilliant, chiefly golden on an azure ground. Round the eye is a line of brownish gold colour, whence the ancients gave this fish the name of *chrysophus*, or golden eye-brow.

The albicore (*schomber thinnus*) is one of the fish most frequently

quently met with in the ocean between the tropics. Its characters are, *two* dorsal fins: the foremost, near the head, has fourteen sharp rays, and rises out of a channel; the second is close to the first, and has also fourteen rays, the third and fourth longest. On the back, between the dorsal fins and the tail, are eight or ten small fins, at equal distances, narrow towards their roots, broad towards their extremities, with long rays curving *forwards*. The pectoral fins are scythe shaped, and have each thirty-four slender rays close to each other; the ventral fins, a little behind the pectoral, have each six slender rays, of which the first is pointed and sharp, and the others split into fibres at the extremity. On the sides of the body are a kind of channels, destined to receive the pectoral and ventral fins when the fish shuts them up. Behind the anus is a fin with thirteen rays; and beyond this anal fin thirteen small fins, similar to those on the back. The tail fin forms a crescent. The body of the fish is round, diminishing towards the tail; the head terminates in a point; the jaws have very small teeth, and the palate is studded with bony points. These fish arrive at the size of from four to six feet in length, and from thirty to seventy pounds weight; they swim in troops, and often follow a ship for several days.

Bonita (*schomber pelamis*), which is also commonly met with in the ocean between the tropics, is nearly the size of the albicore. The foremost dorsal fin has fifteen rays, the second only eleven; the pectoral, each twenty-seven; the ventral, six; the anal, fourteen; and the tail fin, twenty-six. It has, besides, seven small fins on the back; a golden circle round the iris; the body marked vertically with four black stripes; the scales very small and close together.

Four species of the flying-fish (*exocœtus*) are noticed by naturalists. The general characters are, head scaly, mouth without teeth, jaws connected at each side, pectoral fins large and formed for flying.

1. *Volitans.*—Between the size of the mackarel and herring; colour silvery; pectoral fins bluish, edged with yellow; ventral fins, and extremity of the tail, reddish. The rays of the pectoral fins are united by a glutinous membrane, and diverge from

the body, so that the fish can extend them in the manner of wings, and thereby elevate and sustain itself in the air for some seconds; a faculty which it seems only to make use of to escape its voracious enemies, the dolphin, albicore and bonita. The flesh is eaten. This species inhabits the tropical seas and a few degrees beyond them.

2. *Exiliens* (swallow-fish).—Ventral fin reaching to the tail; fins yellowish at the base, and bluish at the extremity. Met with in the Mediterranean and Red Seas. Its flesh is esteemed.

3. *Mesogaster* (Atlantic flying-fish).—Ventral fins in the middle of the abdomen.

4. The fourth species seems to differ from the preceding only in having a dark blue spot on the dorsal fin nearest the tail.

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Cetaceous animals have a form so different from terrestrial ones, that naturalists long placed them in the class of fishes, and afterwards made them a distinct class; nevertheless, as their internal organization resembles that of all other mamiferous animals, they have at last found a stationary place in the last family of the class of mamalia. They respire by lungs, they bring forth their young alive, and nourish them with milk from their teats. They are entirely without feet. Their skin is smooth, without scales or hair; their body conical; no external ears; the nostrils open on the summit of the head, and capable of driving out, with great violence, the water which has penetrated into the throat. They feed on fish and other sea animals. This family is composed of ten genera, according to the characters in the following table.—*(Lacepède, Hist. Nat. des Cétacés.)*

Mouth						Genera.
with teeth	in the palate, in the jaws;	dorsal fin			10	hyperodon
	in the jaw; upper	and lower	dorsal fin		9	delphinus
			no dorsal fin		8	delphinapterus
		only	dorsal fin		4	ananarcus
			no dorsal fin		3	narwhelus
	lower	dorsal fin			7	physeterus
		no dorsal fin				
	spouts on the nose at the	base			5	catodon
		point			6	physalus
without teeth; with horny laminæ in the upper jaw		dorsal fin			2	balænoptera
		no dorsal fin			1	balæna.

The whale, without contradiction, holds the first rank among the animated beings of the ocean. Its body is an enormous mass of flesh, and its head occupies from one-fourth to one third of its whole length. In its external form it presents the appearance of a monstrous fish; but its internal organization offers rather the skeleton of an immense land animal; the ribs and vertebræ being similar to those of quadrupeds, the bones of the fins resemble those of the arm, hand, and fingers of a human being, and are in like manner put in motion by different muscles.* With these fins or arms the female embraces and carries off her young when in danger, and they also serve the animal to turn itself in the water. The tail, which is confounded with the body, is terminated by a horizontal fin composed of two lobes, and serves both to direct the course, and to diminish the velocity in descent. At the bottom of the mouth is an intestine capable of receiving the body of a man, which is a receptacle of air, by means of which the animal increases or decreases its gravity as it shuts or opens this intestine; and moreover the thick coat of fat immediately under the skin enables it to float with ease. The greatest size to which whales arrive (as far as is known) is eighty feet, and Buffon, supposing that the lives of animals are in proportion to their bulks, concludes, that as the carp lives 200 years, a whale ought to live a thousand. The appearance of old age, in this animal, is announced by marine plants, and barnacles adhering to it, and which only attach themselves when the skin is grown callous by old age. Whales are sometimes seen in troops, whence some naturalists suppose they live in society; but solitary individuals are very commonly met with, and still more frequently two in company.

Eight species of the whale (i. e. five without dorsal fins,

 balæna,

* This resemblance is one of the facts misunderstood, which has led to the popular belief of the antient existence of giants; for it being taken for granted, that these bones found in the soil, belonged to human beings, it was accurately calculated, by the rule of proportion, that these beings must have been from eighty to one hundred feet high.

balæna, and three with these fins (*balænoptera*), are described by naturalists. Those without dorsal fins are,

1. The great black whale *(balæna mystecetus)*, arrives at the common size of sixty to eighty feet; the colour of the back is a fine black, marked with whitish stripes, the belly a shining white. It is met with in greatest numbers in Davis' Strait, in February and March. According to some, it quits these parts in November, and enters the river St. Laurence, where the female brings forth in the brackish waters; and, in the spring, repasses with the young to the north. A prime fish gives from fifty to sixty barrels of oil.

2. The North Caper *(balæna glacialis)*, so named from being most frequently met with in the vicinity of the North Cape of Lapland, differs from the great Black Whale chiefly in colour and dimensions, being much smaller, and the back whitish. Its extreme agility renders it difficult to be struck, and besides, it does not give above ten to twenty barrels of oil.

3. The Scrag Whale *(balæna gibbosa)*, is chiefly distinguished from the great black whale, which it resembles in colour, and gives an equal quantity of oil, in having near the origin of the tail, six great lumps. It is common on the coasts of the United States of America.

4. The Hunchback Whale *(balæna nodosa)*, has its name from a hump on the back a foot high, and the thickness of a man's head. It affords but little oil.

5. The Pike-head, or sharp-nosed whale *(balæna boops)* has near the middle of the summit of the head a kind of rising, in which are the two blow-holes so close together as to appear but one, and before them are three rows of round lumps. On the back, towards the tail, is a horny protuberance, the belly is wrinkled longitudinally, the furrows of which are a bright red, and their prominences black or white. When the sea is tranquil, this species plays at the surface, turning on its back with great agility, and springing to a considerable height out of the water. It is common in the Greenland seas; and Captain Cook met

met it in troops in the South Atlantic, near the Strait of Magellan.

The whales with dorsal fins *(balænoptera)*, are, 1st, The fin-fish *(balæna physalis)*, which is as long, but slenderer than the black whale. On the back, nearest the tail, is a triangular erect fin, three or four feet long, and curved backwards; the lobes of the tail fin form nearly a triangle, the back is a shining brown, the belly a brilliant white. This species seems to be widely diffused, being very common in the Greenland seas, from whence it is said the great black whale disappears on its arrival. It is also met in the North Atlantic, in the Indian sea, and great Northern Ocean. It does not give above ten barrels of oil, and its whale-bone is of inferior quality, whence it is little sought after by European fishers; but the Greenlanders prefer it as food, its flesh being said to resemble that of the sturgeon.

2. The round nosed whale *(balæna musculus)* differs from the pike-headed whale in the shape of the nose; the upper jaw terminating in a round point, and is much narrower than the lower into which it lodges, as well as in having a dorsal fin curving backwards, directly opposite the anus. The mouth is large out of all proportion, the back black, the belly white; the latter wrinkled from the extremity of the lower jaw to the navel. An individual of this species ran aground under the castle of Abercorn, in 1692, which measured seventy-eight feet in length, and thirty-five in the greatest circumference.

3. The beaked whale (*balæna rostràta*) is the smallest species, not exceeding fourteen feet in length. Its jaws are long, narrow, and pointed, the lower longest; on the hinder part of the back a round hump, the tail fin crescent formed, the back black, the belly white, and wrinkled. It is common on the coast of Greenland; but as it swims fast and gives but little oil, it is seldom pursued by the whalers.

Cetaceous animals, with teeth in the under jaw only, are divided into three genera; *cachalot, physalus,* and *physeterus*, each of which contains two species. The general characters are the body oval or conical, the under jaw shorter and narrower

than the upper, and armed with teeth, with corresponding alveoles, in the upper a single spout, the eyes near the insertion of the lateral fins. In the head of the cachalot is found the matter called spermaceti, which is, in fact, the medular substance of the brain, and the spinal marrow. This substance, named *adipocire* by naturalists, is contained in two unequal compartments, one over the other, and separated by a membrane; the upper compartment usually contains seven to eight small barrels of matter of a superior quality. The lower chamber communicates with the spine by a canal, and as it is emptied, the spinal marrow flows into it, affording, in the whole, ten to twelve barrels of inferior matter. While warm, this substance is fluid, but coagulates in cooling, and then resembles the internal substance of the water melon, in which state it is brought home; in order to separate the oil it is several times melted until perfectly white, when it acquires a certain solidity, and is cut into cakes for sale. The chemists have discovered, that spermaceti can be extracted from all kinds of fish oil, and in greatest quantity from the dregs they deposit.

Most species of the whales with teeth are met in great numbers in the Northern seas, particularly near the coast of Lapland, where they go in troops. They are much more active than the whales properly called, and there are but one or two spots near the fins where the harpoon will penetrate: besides they are very wary, and consequently difficult to be taken. Their blubber is full of tendons, and affords but little oil.

The two species of cachalots are, 1st, the great cachalot, or spermaceti whale, *physeter macrocephalus*; and 2d, the *physeter cylindricus*. Their common characters are, the head almost square, and more than one-third of the whole length. No dorsal fin. The great cachalot is from fifty to sixty feet long: the lower jaw has, on each side, from twenty-three to thirty strong conical teeth, curved towards the extremity of the mouth. In the spaces between the alveoles in the upper jaw, are twenty little sharp points, not more than a line above the gum; the back is blackish or slate colour, the belly white. It feeds on porpoises,

porpoises, seals, sharks, &c.; the latter of which it inspires with such terror that a shark will not approach the dead carcase, though it eagerly seeks after the flesh of every other species of cetaceous animals. The great cachalot is common in the Greenland seas and Davis' Strait. In 1784, thirty-four individuals ran aground in Audierne bay, on the coast of France, the largest of which was forty-five feet long.

The *physeter cylindricus* arrives at the length of forty-eight feet; the lower jaw is furnished with twenty-five teeth on each side, curved like a sickle, and pointed, besides an impair tooth in front. The spout is in the centre of the head. On the back is a lump eighteen inches high, and four feet and a half long at the base. The tail-fin crescent shaped.

The two species of the genus physalus are, 1st, the lesser cachalot, *physetor catodon;* and 2d, *physeter trumpo.* The common characters are no dorsal fin; the spout at the extremity of the nose. The lesser whale has the head roundish, the lower jaw rather narrower and longer than the upper, and furnished with singular shaped teeth; the part inserted in the jaw being less in circumference than the summit, which is flat, and marked with concentric lines. On the back is a rugged calosity. Near the end of the sixteenth century, 102 individuals of this species were driven on shore in the port of Kairston, Orkneys; the largest of which was twenty-four feet long.

The *physeter trumpo* varies in length, from forty-eight to sixty feet, and the head is almost half the length. The upper jaw is much larger and thicker than the lower, rounded at the sides and flattened at the extremity, like the nose of a bull. The under jaw has, in each side, eighteen straight pointed teeth. The spout at the exremity of the nose is a foot in diameter; the lateral fins very small, and placed at the thickest part of the body; a hump on the back; general colour blackish grey; skin very smooth. It is the most active of the whales, and when attacked is said to turn on its back and defend itself with its mouth.

In the great cachalot, in particular, balls of ambergris are frequently found floating in a liquor of a deep orange colour, which has a stronger odour than the ambergris itself; the liquor is contained in an oval bag, three or four feet long, suspended directly over the testicles. The ball of ambergris is composed of concentric coats like an onion; four are the greatest number ever found in one animal, and the weight of the whole seldom exceeds 20 lb. It often contains small substances resembling the beaks of birds, which are the mouths of the cuttle fish on which the animal feeds. It is said that the old males only afford this substance.* This species is very common on the coasts of the United States of America, and particularly in the vicinity of Bermudas, whence it is sometimes called the cachalot of Bermuda.

The two species of the genus physeter are, 1. The sharp-nosed cachalot, *physeter microps*; and 2. high-finned cachalot, *physeter mular*. The generic characters are, a dorsal fin, and a spout in the middle of the nose. The sharp-nosed whale has in the lower jaw eleven teeth on each side, curved forwards and a little outwards, hollow at the root, conical and sharp pointed; on the back an erect fin of considerable height. It is the determined enemy of the balena boops and beluga, feeds on seals and porpoises, and is chiefly found in the northern seas.

The *physeter mular* has the teeth less curved than in the last species, and terminated obtusely; behind the back fin, which is very

* Ambergris (of which naturalists do not accord as to the nature and origin) is also found floating on the surface of the sea, or washed up on the shores, particularly among the Moluccas, Maldivas, Madegascar, Philippines, Japan and China, occasionally on the coast of Brasil, and often on the west coast of Africa, between Cape Blanco and Portendik, and on the east coast from Mosambique to the Red Sea, among the Bahama islands, &c. The two largest pieces thus found weighed one 182 lb. and was purchased by the Dutch East India company, from the King of Tidor, for 11,000 rix-dollars. The other 225 lb. was sold by the French East India Company, at Lorient, in 1755, for 52,000 livres.

very long, are three lumps, the foremost eighteen inches high, the middle six, and the hindmost three. It arrives to the size of sixty feet.

It is probable there are other species of whales, or at least varieties of those we have described. Captain Cook met a whale near New Zealand, about twelve yards long, with two large fins behind the head, two spouts, and mottled all over black and white. The same navigator met entirely white whales in the Great Southern Ocean; and white whales have also been seen in Davis' Strait. This colour, may however, be owing to disease.

The narwhal *(monodon)*, or single tooth, (vulgo sea-unicorn), forms a genus of the greater cetaceous animals. Its generic characters are, a horizontal tusk, projecting from the upper jaw; no teeth in the mouth; no dorsal fin. It is said to arrive at the length of sixty feet, but the common size does not exceed twenty to twenty-five feet. The body is a long oval, the back broad convex, and diminishing towards the tail; the head small, round, elevated on the summit, and terminating obtusely. The horizontal tooth, or tusk, sometimes proceeds from the right side, at others from the left side of the jaw. It is fifteen or sixteen feet long, of a spiral form, as if twisted, and terminated in a sharp point; its substance is an ivory much harder and not so liable to turn yellow as that of the elephant. On the opposite side from the tusk are observed the rudiment of another tusk covered with the skin. The opening of the mouth is not larger than to admit the fist; the eyes are protected by a kind of lid, and in a line with the corners of the mouth. On the back part of the head two spouts with but a single orifice. The lateral fins only a foot long; the tail fin composed of two oval lobes; an elevated ridge on the back, three inches high, extending from the spout to the origin of the tail. The back greyish white, with a great number of black spots; belly entirely white, shining and soft as velvet. It feeds on fish of the genus of pleuronectes, which it is thought to pierce with its tusk, and

and suck the substance by continually passing the tongue over them.

The narwhal is the most redoubtable enemy of the other species of great cetaceous animals, over whom his tusk and superior agility give him great advantage. It is not uncommon to meet individuals with the tusk broken off, probably from having struck it too forcibly into a whale, or against some hard body.* Though this animal wanders towards the equator, its habitual residence seems to be the Frozen Ocean, its tusks being found in greatest quantity on the northern coasts of Iceland and Lapland. The velocity with which it swims, and its great agility, would save it from the attacks of man, as they do from the vengeance of the whale, if it remained always in the open sea, but as it is obliged frequently to respire the atmospheric air, it seeks the bays free from ice, in which such numbers crowd together, that they are obliged to rest their tusks on each other's backs, in which situation, being incapable either of swimming or diving, they become an easy prey. This animal affords but little oil, which is, however, of a superior quality to that of the black whale.

The anarnak *(monodon sparius)* differs from the narwhal in having two small tusks, proceeding from the upper jaw, and in having a dorsal fin. The tusks are only an inch long, conical, and a little curved towards the extremity. It has but one spout. The flesh and fat of this animal are said to be violently purgative, which is the signification of the name given it by the Greenlanders. It chiefly keeps the open sea.

A third animal of the cetaceous family has two tusks, projecting horizontally from the anterior part of the skull, distant from each other at the roots but two inches, but diverging so as to be eighteen inches distant at their points.

Though nature seems to have assigned the Arctic Sea as the habitual

* An animal of this species struck its tusk so violently into the bottom of one of Le Maire's ships as to leave a piece of it sticking there.

habitual dwelling of the greater cetaceous animals, she has not confined them to this frozen region, or fixed any limit to their wanderings; or rather, she has peopled the other seas with similar species. The scrag-whale, the hump back, the fin-fish, and the physeter trumpo, are met with along the coasts of America to Florida, and the scrag whale is not uncommon in the Indian Sea and Great Northern ocean. The balena boops, as we have before observed, has been met in whole troops near the Strait of Magellan. The round-nosed and beaked whale occasionally visit the coasts of France and Great Britain,* while other species brave the heated waters of the equinoxial, and are found in considerable numbers in the Gulf of Guinea. A similar dispersion is observed in the other oceans, and the whale fishery is carried on with success in the sea that separates the northern extremities of Asia and America, in that of New Holland, among the Philippine and Carolina Islands, and near the southern extremities of Africa and America. The Kamtschadale, the Tchouktchi, the N.W. American, as well as the Greenlander and the Esquimaux, feed on the flesh of the whale, drink its oil or use it for fuel, employ its bones in the construction of their houses, and its intestines for various domestic purposes. The more

* It is certain that whales were formerly much more common on the coast of the Bay of Biscay than at present. Oppian, who lived in the reigns of Severus and Caligula, or the third century, in his poem on Fishing, mentions at length that of the whale, whence it is to be inferred that these animals were then not unfrequent on the coasts of Gaul. In the ninth century it is recorded, that certain species visited the coast of France very regularly in autumn; and in the same century their flesh was sold in the market, being eaten either drest with peas or roasted; their tongues, in particular, were deemed very delicate and tender eating, (the tongue of the whale is a solid mass of grease). In the thirteenth century, among the fishes taken for food on the coasts of France, are mentioned the whale, the sea-dog (probably the seal), the sea-wolf (probably shark), and the sea-hog or porpoise. About the middle of the fourteenth century, Edward III., then master of the coasts of France on the Bay of Biscay, allotted towards the equipment of his fleets, the whales taken in the bay and carried into his ports.

more miserable savage of Australia, endowed with less energy than these northern tribes, dares not venture to attack the living whale; but when accident throws one on shore, its corrupted flesh affords a feast to the whole tribe within whose limits it is found.

The lesser cetaceous animals comprehend three genera. The common characters are teeth in both jaws; one spout; auditif organs behind the ears almost imperceptible: 1st. genus *Delphinaptera*, without dorsal fin: 2d. *Delphinus*, with dorsal fin; 3d. *Hyperodon*, teeth on the palate and dorsal fin.

The genus *Delphinaptera* has but one species, the Beluga (*delphinus leucas*). It arrives at the length of twelve to fourteen feet, the body conical and greatest circumference near the lateral fins, head short, and terminated by an obtuse muzzle; on the summit is an elevation in which is the spout; jaws nearly of equal length, eighteen small teeth in each, those of the under obtuse at top, and similar to the molar teeth of terrestrial animals, the upper ones more pointed and a little curved. The lateral fins broad and nearly oval, an angular calosity on the back, colour whitish, with brown and blueish spots when young: feeds on cod and other fishes. It is only found in the Northern Frozen Ocean, where in winter it seeks the bays not frozen.

The genus *delphinus* contains seven species. 1 The porpoise (*delphinus phocæna*) varies from four to eight feet in length; body conical decreasing towards the tail; head represents an obtuse cone, terminated by jaws eight or ten inches long, each furnished with forty-eight little sharp white teeth, interlocking with each other; nostrils between the spout and the extremity of the nose are each furnished with a bristle, half an inch long; tongue fringed at the edges; lateral fins near the throat, dorsal fin near the middle of the trunk, shaped like a half crescent, the horn towards the tail; behind the dorsal fin the back is flattened, with a rising in the middle extending to the tail fin, which latter is very large, composed of two lobes with rounded points. The belly is white, all the rest a blackish blue. The blood of this animal has the same heat

as

as that of quadrupeds, and it is said to become periodically blind in the month of June, by a membrane forming over the eye. Its food is, mackarel, herrings, and other small fish. Porpoises are almost always seen in troops, and often swim in a regular line in front, making great bounds out of the water, and turning in the air with surprising agility. The porpoise affords two prognostics to seamen, both of which are however often fallacious. As this animal is observed to swim most frequently against the wind (probably in order to aspire as much as possible of the atmospheric air), when it is calm, the direction from which the wind will come is prognosticated by his course; and the rubbing himself against a ship's sides, which fortunately for the superstitious seaman he does but very rarely, is ominous of an approaching storm. The liver of the porpoise is not much stronger than that of the hog, and a part of the flesh resembles the coarsest part of beef, and is often preferred by seamen to salt provisions.

2. The dolphin of naturalists (*delphinus delphis*), *vulgo* the bottle nosed porpoise, arrives to the size of ten feet; body oval, thickest at the back fin, and decreasing towards both extremities; the head is not swelled on the summit as in the common porpoise, but diminishes insensibly in thickness, and is terminated by a long flat snout resembling the bill of a goose; both parts of the snout are of the same length, furnished with rows of cylindrical pointed teeth three inches above the gums and interlocking, they are thought to be venemous. Below the eyes is a white stripe, extending towards the insertion of the lateral fins. This species varies in colour. 1. Back blackish, the rest yellowish grey or pearl colour, speckled with iron grey spots. 2. Upper part very dark grey, and lower part very light grey. 3. Entirely snow white (*delphinus chinensis*). The bottle nosed and common porpoise have similar habits, and are alike dispersed throughout all parts of the ocean. The female, it is said, goes six months, and brings forth only one, which she carries till it can swim; the perfect growth is thought to be ten years, and the term of life thirty.

3. The Grampus (*delphinus orca*) arrives at the length of twenty-

twenty-five feet. The head descends with an uniform slope, and terminates in a round short snout curved a little upwards. The lower jaw is much the broadest; each jaw has thirty to forty teeth, conical, unequal, and curved at top; the dorsal fin four feet long. The upper part black, lower white. The grampus blows the water from its spout with great force and noise: it is the most voracious of this family, feeding chiefly on seals and flat fish, is an enemy of the whale, whom it often drives on shore, and is met with in every climate of the ocean, and in the Mediterranean.

4. *Delphinus tursio* (nesarnack of the Greenlanders) is the size of the dolphin, and has a similar snout and dorsal fin. In each jaw are forty-two cylindrical teeth round at the summit, and half an inch above the gums. Behind the dorsal fin is a lump, four to five inches high, extending towards the tail: back black; belly white.

5. The Greenland sword-fish (*delphinus gladiator*) is commonly eleven to twelve feet long, but sometimes much larger. The dorsal fin, from which it derives its name, is three to four feet long, eighteen inches broad at the base, narrowing to a point and curving backwards; it is covered with a skin similar to that of the body, and consequently can be neither an arm of offence or defence, and in fact, it is with the mouth that the sword fish attacks the whale, of which it is the determined, and from its great strength and agility, the most dangerous enemy. It is chiefly met with in Davis' Strait, and near Spitzbergen.*

6. The *Delphinus feres* has the head nearly as thick as it is long, very convex on the top, descending abruptly to the snout, which is short and round like that of a calf; the jaws equal and furnished with twenty teeth each, ten of which are considerably

* It is probable that this species wanders to the south, for it seems to be well known on the coast of New England, by the name of *killer*, and on that of Kampschatka, whose natives call it *kisatki*, and by whom it is so dreaded, that when fishing they not only endeavour to avoid it, but even make it propitiatory offerings.

considerably larger than the others, the part inserted in the jaws conical and curved, the summits round and channelled, so as to appear divided into two.

7. *Delphinus dentatus* has its name from having only two sharp teeth in the lower jaw, which as well as its dimensions of forty feet long, seems most properly to place it in the genus of *physeter*: the other characters however have caused it to be included in that of *delphinus*. They are the shape of the body which is conical, the greatest circumference at the lateral fins, the head convex, upper jaw flat, and terminating in a snout like the bill of a duck. The dorsal fin at the origin of the tail, shaped like the head of a lance, pointed and inclined backwards. The tail fin crescent shaped, upper part of the body blackish brown, under part lighter. An individual of this species, twenty-one feet long, was taken in the Thames, above London Bridge, in 1783.

1 The genus *Hyperodon* contains but one known species (*delphinus butskopf.*) Its distinguishing character is having the palate covered with little unequal hard points or teeth, two or three lines above the flesh; there are besides large teeth in the upper jaw, and a very few in the under, the head is thicker than it is long, very convex on the summit, narrowing suddenly, and terminating in a kind of round flat back; the dorsal fin nearer the tail than the muzzle; the lateral fins on the lower part of the throat, where the circumference is greatest; the eyes are convex like those of quadrupeds, and furnished with lids.

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In the family of oceanic amphibious animals, naturalists include four genera, very different as well in organization and external appearance, as in their habitudes and the nature of their food. The generic characters are denoted as follows:—

Teeth { of three kinds; upper incisive { six, phoca. / two, morse. }
Teeth { less than three kinds . . . { canine teeth, dugon. / no canine, manati. }

The external characters of the genus *phoca*, or seal, are five palmated

palmated toes on each foot; the hind feet broader than the fore, and directed backwards, so as to form with the tail, which is very short, a kind of fin, serving the animal as a rudder, while the fore feet perform the office of oars, the latter alone are of any use to the animal on shore, the hind feet being dragged after him in walking.*

Nineteen species of seals have been described, several of which however are still very imperfectly known.

1. The common seal, (*phoca vitulina*, sea calf). The head round, nose flat, large black eyes, all the toes with strong sharp claws, no external ears, body covered with thick short hair, colour various, length five to six feet. It is the most widely diffused of the genus, being met with in the Frozen Ocean, in all latitudes of the Atlantic, in the high latitudes of the Southern Seas, in certain regions of the Indian Sea and Grand Ocean,† in the Baltic, Mediterranean and Black Seas, in the Caspian Sea and lake Baikal, and even in the fresh water lakes of Onega and Ladoga.

2. The white bellied or pied seal, has the nose taper and elongated, large white spots on a deep black ground: length seven feet. This species is met in the Adriatic, and is susceptible of being domesticated to a certain degree, individuals having been taught tricks and shewn at Paris.

3. Hooded

* Seamen have applied the names of several land animals to the genus of seals in so arbitrary and fanciful a manner, that it is often impossible to discover what particular species they speak of. The name of sea calf given to the common seal, is certainly from its cry; that of sea dog, from the head of some species having a resemblance to that of a bull dog, with the ears cut close; that of sea cat, to the mouth being furnished with whiskers, a character common to all the species; that of sea wolf, from the voracity of the animal, or from the teeth resembling those of the land animal; of sea fox, from the cunning practised in catching fish; of sea lion, from the mane of the male, and another species probably from its roar; of sea bear, from the skeleton of the head resembling that of the land bear; of sea elephant, from the tusks.

† In the Indian Sea seals do not appear to be met within the tropics; in the Grand Ocean they are found in all the southern latitudes; but none have been seen from the equator to 20° N.

3. Hooded seal (*phoca monachus*), is named from the loose skin behind the neck, which when the animal lays on its back, folds like the cowl of a monk. The orifice of the ears are not larger than a pea, the toes on the fore-feet have nails, those of the hind-feet are without: length eight feet and a half. This species is said to be only found in the Mediterranean, and chiefly on the coast of Dalmatia.

4. Long-necked seal (*phoca mutica*), besides this character, denoted by the name, the fore-feet of this species resemble fins, and are without claws.

5. The Falkland Island seal, has short narrow pointed ears, no claws on the fore-feet, and four claws only on the hind-feet; length four feet, colour cinereous, tipped with dirty white.

6. Tortoise-headed seal (*phoca testudo*), head resembling that of the tortoise; said to be met on the coasts of Europe, but is little known.

7. Ribbon seal (*phoca fasciata*), colour, body blackish, neck, sides and haunches with yellowish stripes; met with at the Kurile Islands.

8. The leporine seal, head long, upper-lip thick, soft fur of a dirty white, nails on both fore and hind-feet; Frozen Ocean, ascends the rivers in search of prey.

9. Great seal (*phoca barbata,—lakktak* of the Greenlanders), resembles the common seal, but grows to the length of twelve feet.

10. Rough seal (*phoca hispida*, or *fœtida, neit-soar* of the Greenlanders), is distinguished by the hair sticking outwards, and being mixed with bristles like those of the hog.

11. Porcine seal, derives this name from the snout resembling that of a hog; it has the appearance of external ears; is met with on the coast of Chili, whence it has been called *phoca chilensis*.

12. Eared seal (*phoca australis*), ears an inch long, very narrow and pointed, long white whiskers; no apparent toes or nails on the hind-feet, both on the fore feet; a tusk and smaller

secondary tooth on each side; length two feet; met with in the Strait of Magellan.

13. Crested seal (*phoca cristata, clapmyss* of the Dutch), has its name from an excrescence of thin soft flesh on the forehead, with which the animal can cover its eyes to defend them from the whirlwinds of snow. The body is covered with a long black woolly fur, under which is a short white fur, making the whole appear grey. This species is very numerous in the Frozen Ocean, and particularly in Davis' Strait, between September and March, in which last month they disappear, but return with their young in June very emaciated. In July they again disappear, but return in September very fat.

14. The harp seal (*phoca Grenlandica*), is distinguished by two black crescent-shaped spots on the sides, the rest of the body being covered with greyish white coarse hair. It appears to be confined to the northern seas, being met with on the coasts of Greenland and Siberia to Kamtschatka.

15. The little seal *(phoca pusilla)* is only twenty-eight inches long, has the rudiments of external ears; the webs of the toes extend beyond the nails, the hair is soft and smooth. It is met with in the Mediterranean; and from the descriptions of navigators, probably on the coast of Chili, Newfoundland, and N.W. America.

16. The ursine seal has ears one inch and a half long, strait, pointed, and without hairs on the outside; it has eighteen very pointed teeth in each jaw, locking into each other like the teeth of two saws; the colour a deep brown with white points, so as to make the whole resemble an iron grey. The full grown males are eight or nine feet long, and weigh 800 pounds; the females considerably smaller. In its shape and manners the ursine seal has a resemblance to the sea-lion; and is met with in the same regions of both hemispheres.

17. The sea lion of Cook *(phoca jubata)*, is distinguished by the male being furnished with a mane on the neck, composed of strong hairs two or three inches long, of a yellowish tan colour, and

and which the animal erects when irritated. The whole of the body has nearly the same circumference, so as to resemble a great cylinder. The length of the full grown male is ten to fourteen feet, and the weight 12 to 1,500 lb. The external ears are only half an inch long, stiff, and doubled back at the extremity; the inside smooth, and the outside covered with hairs. The female wants the mane, and is much less than the male.

This species is common in the high latitudes of the great Southern and Northern Ocean. In the former, on the Magellanic lands, Staten Island, the Falkland Islands, New Zealand, &c.; in the Northern Ocean, in Behring's Bason. They live in families of an adult male, ten to twelve females, and fifteen to twenty young of both sexes. The family keep close together, as well in the water as on shore: when on the latter they make for the sea, in a strait line, on the least alarm, and seldom attempt to defend themselves, except when their escape is cut off, or when badly wounded, when they become furious, and try to bite their assailant. The males often fight for the females, and the family of the vanquished becomes the prize of the victor. The season of their amours is the summer of the respective hemispheres, and they bring forth at the same season, going eleven months, and having seldom more than one, and never more than two young. They bring forth on shore, and during the month that they remain there, appear to take little or no food; being then extremely emaciated, and their stomachs found entirely empty, with the exception sometimes of several large stones, which the animal probably swallows to keep that organ distended, and thereby weaken the calls of hunger.

18. The bottle-nosed seal (*phoca leonina*), the sea lion of Dampier and Anson, is the largest species of the genus, arriving at the length of twenty feet. Its distinctive character is an excrescence, resembling the carbuncle of the turkey-cock, which hangs from the upper lip of the male. The female is without this excrescence, but has the upper lip split, whence it probably received the name of sea lion. This species is only met in the great Southern Ocean, particularly on the isles of St. Paul and

Amsterdam, New Georgia, Staten Island, the Falkland Islands, Juan Fernandez, &c. The males have often bloody battles for the females, of whom each has several. The season of their amours is winter, and they bring forth at the same season, seldom more than one, and never more than two young.

19. The urigne seal has the body conical, very thick at the shoulders; the head like that of a dog with the ears cut off, the upper lip split, the fore-feet have only *four* toes, enclosed in a membrane, so as to resemble fins; the hind-feet are almost concealed in a continuation of the skin of the back, but have five toes articulated like those of the human hand. Length, three to eight feet. They are common on the coasts of South America, where they are distinguished by the name of sea wolves; whence the name of Lobos is given to many islands.

Most species of seals emit a very disagreeable odour. Their flesh is coarse, oily, and disgusting; nevertheless, the seal hunters accustom themselves to the use of it, and prefer it to a constancy of salt provisions. The flesh of the young animals is the least detestable; and the tongues, heart, and liver, the best in the comparison of badness. Seals are supposed to live to a great age. Unlike land animals, they seem to delight in thunder storms, sitting on rocks, and contemplating the convulsion of the elements with evident pleasure.

The appearance of seals is generally considered an indication of the vicinity of land, but is by no means a certain one, these animals being sometimes met at sea 50 or 100 leagues distant from it.

The second genus of oceanic amphibious animals, the *morse* of the Russians, is at the same time the genus and the species; it is the *walrus* of the Germans and Dutch; the *rosmarus* of the Danes, Swedes, and Icelanders, *trichecus rosmarus* of Linnæus. By English seamen it is called sea-horse and sea-elephant: the former is probably a corruption of the Russian name morse, and the latter from its tusks. The French seamen call it *vache marine* and *bete à la grand dent*; the former, from its voice resembling that of the cow. This animal arrives at the length of twelve

twelve to sixteen feet, and weighs 12 to 1,500 lb. The body is conical, the greatest circumference forwards. From the upper jaw projects two tusks curved inwards, generally about two feet long, and eight inches circumference at the base, weighing from three to six pounds: except a small cavity at the root, they are solid throughout, and of a fine hard white ivory. The young, until a certain age, are without them, but the rudiments are visible, and individuls are met with only one, the other being probably lost by accident. They have no incisive teeth, no external ears; the tongue is forked, and the mouth surrounded by hollow whiskers the thickness of a straw. Above the mouth are two nostrils, from which the animal spouts water: the feet or fins differ little or nothing from those of the seal. Besides a large quantity of oil, and their teeth, their skins are converted by the Russians into tackling for carriages and other purposes. They bring forth one young only in winter, on the ice or rocks: their general habitudes resemble those of the seal, except in the article of food, the morse feeding only on vegetables.

The morse inhabits the northern seas only, and appears to have latterly approached the Pole; none being now met in the Atlantic, though they formerly frequented the neighbouring coasts to the gulf of St. Lawrence.* They are most numerous on the coast of Asia, between the Oby and Cape North; their tusks are also found on the shores of Nova Zembla, and of Hudson's Bay, and on those of the gulf of Anadyr.

It would seem that a second species, or a variety of the morse, is met with at the entrance of the Frozen Ocean, between Asia and America, which is described by Captain Cook, under the name of sea-horse. The principal difference seems to be in the size of the tusks, those of the animals met by Captain Cook, in great troops on the ice, being only six inches long.

* Towards the end of the sixteenth century, adventurers from St. Malo visited the isles Ramees (Green islands), to take these animals; and at the close of the seventeenth, the French colonists of Canada hunted them in the gulf of St. Lawrence.

The third genus of oceanic amphibious animals, the dugong, is still little known, and is confined to the Indian seas, and particularly the Philippine islands; it is described as having in the upper jaw two long teeth in the front, and neither incisive nor canine teeth in the lower jaw.

The *manati*, or sea-cow, *trichecus*,* is an animal of singular external organization. Its first conspicuous character is the total absence of hind feet, or any members in lieu; the body, which is very thick forward, terminating in a thick tail, with a kind of horizontal fan-shaped fin like that of cetaceous animals. The head has a resemblance to that of the hog; the neck short or null, the eyes small, the auditif apertures scarcely perceptible; no fore-teeth, but ossified gums; the tongue oval, and fastened near its extremity to the palate, so as to have given rise to the idea of its wanting this member; two arms or fins near the head; without toes, and which are useless on land. The female differs from all other mammiferous animals, in having the parts of generation above the anus; her breasts are on the chest, and very prominent; the skin an inch thick, wrinkled, scabby, and with or without hairs: under the skin a layer of grease, four or five inches thick, resembling hog's lard. The flesh of these animals is agreeable and wholesome; the young ones resembling veal; and it forms a part of the habitual food of the people of the regions where it is met. It chiefly frequents the mouths of rivers and bays near the coast, though it also ascends the rivers, being found in the Senegal, and in the river of Amazons, 200 leagues from the sea. Its fins being useless on shore, it never quits the water, or goes into a less depth than it can swim in. In general it is met in the same places as the green turtle, and feeds on the same grass, being entirely herbivorous. It is a stupid animal, allowing itself to be harpooned, without attempting to escape; in other respects it is sociable, keeping in troops, and shewing attachment to its female, of which it has only one, and affection to its young.

Travellers,

* Lamantin of the French.

Travellers, and after them naturalists, have described five species of the manati, which, however, there seems reason to reduce to two, the great and little; and that the others are merely varieties of these two.

The great manati of Kamtschatka, whale-tailed manati, *trichecus borealis*, is twenty-three feet long, and weighs 1,200 lb. The head and nose resemble those of the hog, the mouth being entirely underneath; the opening is small, and has a double lip both above and below; the outer ones being spongy, thick, and swelled with tubercles, from which grow white bristles or whiskers, four inches long. No teeth in either jaw, but two hard bones, which serve to grind their food. The nostrils near the extremity of the nose, one inch and a half long. No eye-brows, but in the great angle of the eye a membrane, which serves to cover the whole eye at will. The skin blackish, rough, and without hairs.

The great manati of the Caribbees has been almost exterminated since their occupation by Europeans; its differences from the preceding are said to be, skin slate colour, with some black hairs; the fins terminated by five nails. Besides the bony callosity in the front of each jaw, it has thirty-two molar teeth placed backwards. Its length twelve to eighteen feet.

The grand manati described by Leguat, as being met in abundance at the isle Roderigues, in the Indian ocean, seems to differ in no respect from that of Kamtschatka, except in having two tusks like the wild boar. It is not, however, impossible, but he may have taken the liberty of a traveller, and given the animal these tusks gratuitously.

The little or round-tailed manati of America (*trichecus manatus*), appears to be the same species met on the coast of Guinea. Its size is ten to fifteen feet, and its weight 6 to 1,200 lb. On the coast of America it abounds from the bay of Campeachy to the south limit of Guiana, among the bays of Cuba, &c. The female brings forth two, and when young, carries them under the fins. The manati of Senegal has four nails on each fin, molar teeth, the iris a deep blue, prunella black.

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All species of oceanic birds belong to the order of *palmipedes*, (web-footed). In this order naturalists include several genera which are not strictly speaking oceanic, never voluntarily quitting the coasts; we shall, however, in this notice confine ourselves to those species met at sea at the greatest distance from land.

1. The man-of-war bird, or frigate, (*fregata, aquilus pelicanus,*) is three feet long, and the wings have fourteen feet spread; the tail is forked, body ferruginous, orbits black, bill red, belly of the female white. It is only found within the tropics, particularly among the West India Islands. Its great length of wings enables it to take vast flights, and it darts with the greatest velocity from a great height on its prey, particularly the flying fish, which often falls a victim to it when it quits its proper element to escape the dolphin. It generally lays its eggs on rocks, and only one or two, of a flesh colour spotted with red.

2. The booby (*pelicanus sula*) has its name from stupidly allowing itself to be seized without attempting either to defend itself or escape. The genus is really oceanic, being met in all seas, and often 100 leagues from land. The generic characters are, the bill strait, like that of the rook, conical, the edges finely notched, the upper mandible formed of three pieces united by two articulations, which enables the bird to raise the extremity two inches from the lower without opening the beak. The nail of the longest toe notched inside like a saw; eye encircled by a naked skin; nostrils scarcely perceptible. Eight species of this genus are described.

1. The common booby.—The size of a full grown fowl; the naked skin round the eye yellow, colour brown, more or less dark; is met with in all latitudes of the temperate zone, but chiefly between the tropics.

2. The white booby.—Size of the last; the naked skin round the eye bright red; all the plumage white, except the upper wing coverts farthest from the body, and the quills, which are brown. This species is less numerous and less stupid than the first. It

is

is chiefly met between the tropics and a few degrees beyond them.

3. The great booby.—The size of the domestic goose; naked skin round the eyes blackish, breast, neck, throat, and upper part of the body deep brown, with white spots, very thick and small near the head, larger and more distant on the neck and throat, and fewest on the back; under part of the body a dirty white, pen feathers brown, bill brownish grey, feet black. Is common on the coasts of Florida.

4. Little booby.—Length eighteen inches; breast, belly and stomach white, all the rest blackish; bill and feet yellowish.

5. Little brown booby.—All brown except the top of the head and the tail, which are a grey white; naked skin round the eyes; bill and feet red. This species, as well as the preceding, is confined to the tropics.

6. The spotted booby.—Differs from all the other species in the shortness of the wings; the head, neck, breast and all the upper part of the body spotted with white on a brownish black ground; the naked skin round the eye, the bill and feet yellow.

7. The gannet, or soland goose, is about the size of the domestic goose; plumage entirely white, except the nine largest wing feathers, which are brown or blackish, and behind the head, which has a yellowish tinge; the naked skin round the eye a fine blue, the iris yellow; under the bill, at each side of the base, a naked yellow skin. These birds are migratory, arriving on our coasts in spring, and in summer returning to the south, probably to the coast of Florida, which seems to be the grand rendezvous of all the migratory birds that cross the Atlantic.

8. The booby of Kamtschatka is the size of the goose; the naked skin round the eye red, the plumage blackish blue, except the thighs, which are white, and the feathers on them in tufts; the upper part of the bill black, lower reddish, feet black.

The general habits of all the species of booby seem to be similar. They fish hovering, the wings almost motionless, and dart perpendicularly on the fish which approaches the surface; they swim with the neck erect, but fly with it stretched out and the

the tail spread. They make their nests on the ground, a great number together, and lay but one or two eggs.

The tropic bird (*phaeton*) forms a genus comprising three species; it is easily distinguished by the long middle feathers of the tail, whence are derived its vulgar names in several languages:* besides this character, the legs are very far behind, short, and the lower part without feathers. Three species are known.

1. The great tropic bird—the size of a small duck; the wings when folded pass the origin of the tail a little; the plumage on the upper part of the head and neck silver white, the stems black; at each side of the head a black semicircular stripe, extending from the origin of the bill over the eye, and terminating at the back of the head; upper part of the body silver white, with transverse blackish stripes; the cheeks, breast, forepart of the neck and under part of the body silver white without mixture, but on the lower part of the sides are some long dark ash colour feathers with white spots on the edges. The six first quill feathers of the wing varied with black and white, the others white with the stem black; the tail quill feathers white, the two middle ones more than a foot longer than the others, and twenty to twenty-two inches the entire length, they are formed of a stiff strait stem, the sides thinly furnished with small shafts; the beak is strong and thick, slightly dentilated at the edges, and of the colour of red coral; the naked part of the leg, feet, and the roots of the toes yellowish, the rest of the toes, web and nails blackish.

2. The little tropic bird is the size of the domestic pigeon; the wings folded pass the origin of the tail five inches; the two middle tail feathers surpass the others by eleven inches; the beak is ash colour near its origin, the rest yellowish; the scapu-

lary

* Boatswain of English seamen, from these feathers being supposed to resemble a marline spike; *paille en cul*, of the French; *pyl staert*, arrow tail, of the Dutch; *rebbo de junco*, of the Spaniards.

lary feathers terminated by black; in other respects its plumage is nearly the same as that of the last species.

3. The third species of tropic bird has the two long tail feathers the colour of the bill, that is a red coral; the rest of the plumage is white, with the exception of some black spots on the wings; it has also the black line round the eye as in the other species.

The tropic bird is confined to the equatorial regions and a few degrees beyond them, and with the exception of the man-of-war bird and storm petrel, is seen the farthest from land of any of the oceanic birds. The shortness of its legs, and their position so far behind, render it heavy and slow on the ground; but its flight is light, rapid and elevated: it also swims well. It seldom visits the shore, except in the season of incubation, which is in September and October, of the southern hemisphere, and in April of the north. The great tropic bird is said to build sometimes in the hollows of decayed trees, but more generally in the crevices of rocks;* it lays only two eggs, of a yellowish white with reddish spots. Its cry, when on the wing, is piercing; it darts perpendicularly from vast heights on the fish it perceives near the surface, and the flying fish in particular often fall a prey to it.

The petrel genus (*procellaria*) contains the greatest number of species, and is the most widely diffused of all the oceanic birds. The general characters are, the bill crooked downwards towards the extremity; a spur instead of a toe behind, deriving immediately from the heel, and without articulation or joint. Twenty-two species of this genus are known, and several species have many varieties.

1. The storm petrel (*pelagica*), or Mother Carey's chicken of our seamen, is the smallest of the order of *palmipedes*, not being larger than a lark; its colour is a smoky black with a purplish tint, and the rump white. The extremities of the wings when shut

* In the Atlantic these birds hatch among the rocks of Bermudas.

shut up pass the tail; and this great length enables the bird to fly with amazing velocity in serene weather, when it darts out of sight in an instant; in stormy weather, however, this length of wing often causes its destruction, the wind then taking such effect on it, that it loses the power of directing its flight. At these times it is often seen seeking shelter between the waves, and reposing its fatigued wings, by running with great rapidity on the surface of the water; during which movement the wings, though spread out, do not vibrate, and only serve to steady the body. The appearance of these birds in numbers, and their flying closely round a vessel, are considered by seamen as prognostics of an approaching storm,—like most other prognostics, they are, however, often contradicted by the event. The storm petrel is met with in all the latitudes of the ocean within the polar circles.

As each of the other species of petrels appears to be confined to certain regions, we shall notice them under the heads of petrels of the Northern Ocean, petrels of the Southern Ocean, and petrels of the Equinoctial Ocean. Those of the Northern Ocean are,

1. The ice petrel of the Frozen Ocean has the general colour black, breast and throat white, bill yellow, feet blue.

2. The ash coloured petrel has the general colour a whitish ash, wing quill feathers deep blackish blue, tail quill black, feet bluish. Its size that of the rook; the beak yellow at the extremity. This species is named *haff-hart* (sea-horse) by the people of the north, probably from its running with great rapidity on the surface of the sea.

3. The puffin is a foot to fourteen inches long; the throat and belly white, the upper part of the body grey, the feet reddish. This species is found in vast numbers in the Scilly Islands and on the rocks of Norway.

4. The fulmar, chiefly found in the high latitudes of the north, though it is also said to be met in those of the south, differs from the puffin chiefly in colour, the upper part of the body being

ing a greyish white. It is often seen on the backs of whales, feeding on their substance.

5. The forked-tail petrel of the N.W. coast of America, is dark ash colour, rump white, feet black, tail forked.

The petrels of the Southern Ocean are,

6. The gigantic petrel, or *osprey*, the Mother Carey's goose of our seamen, the quebranta huessos* of the Spaniards, is the largest of the genus, for though its body when stripped of feathers does not exceed that of a capon, its thick plumage gives it the volume of the turkey cock. It is principally met in the Great Southern Ocean.

7. The pintado, or painted bird of the Portuguese, the damier or chequer-board of the French, is the most common petrel of the Southern Ocean from the latitude of 29°. It is easily known by its plumage, chequered with black and white in regular compartments; the bill and feet are black. The male is the size of a large pigeon. These birds are extremely familiar, often nearly touching the sides of a ship; and are easily taken with a hook baited with a morsel of tallow. They are generally seen in company, either on the wing or resting on the water.

8. The petrel of desolation, or Kerguelen's Land, upper part greenish grey, white below, wings and tail darkest.

9. Blue petrel of the Southern Ocean, of which three varieties are described—the 1st. bluish on the upper part, white beneath; bill and feet blue. 2. Upper part greyish blue, with a deeper band across the wings and back; belly and under part of the wings bluish white. This species was met in great numbers by Captain Cook between America and New Zealand, 700 leagues from any known land; the same navigator also found them on the shores of New Zealand in the month of April, where they burrowed in the earth, or concealed themselves in the crevices of the rocks during the day, and only flew about in the night. The third variety of the blue petrel was seen by Captain Cook in 57° S.

* From *quebrantar*, to break, and *huessos*, bone; probably because when taken, it gives violent blows with its wings sufficient to break a bone.

57° S.; it differed from the last in having the point of the tail feathers white, instead of a blackish blue, and in having a much smaller and slenderer bill.

10. White or snow petrel; bill, legs, and feet, blackish blue, plumage white. The appearance of this petrel was generally found to denote the approach to ice islands.

11. Antaretic petrel, differs from the pintado only in colour, the head, back, and part of the upper sides of the wings, being a deep brown, the belly and under part of the wings white, the tail feathers white, terminated by brown, the feet lead colour. These birds are met with among the floating ices, and disappear as well as all other birds, on approaching the fixed ice, which prevents them fishing.

The petrels of the equinoctial ocean are,

12. The equinoctial petrel of the Atlantic; colour sooty brown, bill yellow, feet brown. It is also met at the Cape of Good Hope.

13. The Brasilian petrel; the size of a goose, colour blackish brown. It is said to dive, and to be met at the mouths of rivers, two circumstances that render its belonging to this genus doubtful.

14. Spotted petrel of South America; general colour black on the upper part, white beneath, part of the head and breast spotted.

15. Pacific petrel (Friendly Islands); upper plumage black, brown beneath, feet spotted brown and black.

16. Dark petrel of Christmas Island; upper part black, white below, web of the toes yellow.

17. Fuligeneux petrel of Otaheite; soot colour, bill, wings and feet black, tail forked.

18. Black and white petrel of Christmas Island; general colour blackish, breast, throat, belly, and rump, white.

19. The Fregatoide petrel; upper part and feet black, white below, rump blueish.

20. Dark grey petrel of Cook; general colour sooty, under wing coverts white, bill brown, feet greenish grey.

There

There are some doubtful species of the petrel, particularly the little petrel of Forster, met at New Zealand. The *diablotin* of the French West Indies, which is black, and the eyes useless during the day, whence it fishes only in the night, in the day remaining concealed in holes in the mountains, particularly in the island of Guadaloupe. The *pardelas gallinera*, and *alma de maestra*, are also doubtful species of the petrel met between the coast of Peru and the island of Juan Fernandes; The *pardelas* is grey, the *pardelas gallinera* black, and the *alma de maestra* black and white, small, and seen mostly in storms.

The general habits of all the species of petrels are the same, they are met the farthest from land of any of the feathered tribe, and only go on shore during the season of incubation; they all form their nests in holes in the earth, all nourish their young with half digested fish from their stomachs, all run on the water by striking the feet rapidly against the surface, while their extended wings preserve their equilibrium. It is from this movement, that the name of petrel is derived, signifying *Little Peter*, the name first given them by English navigators, from their walking on the water.

The albatross, *diomedea*, like the petrel has three foremost toes entirely joined by a web, but is without any spur or toe behind, the bill curved downwards near the point. It arrives at the length of three feet, and the wings from point to point have a spread of eight to ten feet. The colour of the plumage is on the top of the head a reddish grey, the rest of the head, the breast, throat, and all the under part of the body white, the back and upper wing coverts striped transversely, and spotted with dark colour on a whitish ground, the rump and tail white, the great wing quills black, the medium ones and tail quills white, the beak pale dirty yellow, the lower part of the legs naked, and as well as the feet, a flesh colour. This bird is only met in the Southern Ocean, chiefly beyond the latitude of 30°, though it also at times wanders nearly to the southern tropic.

The penguin of the northern and southern seas form two very

very different genera of *palmipedes*, and seem from their imperfect organization, to form the link that unites the orders of birds and fishes. The northern penguin (*alca impennis*) has but three toes: the lower part of the bill is perfect, the wings so short as to be useless in flight, and without pen feathers; the under part of the body white, the rest a glossy black. These birds seldom visit the shore but to breed, they lay but one egg, close to high water mark; in the European seas they do not descend further south than the Hebrides, but on the American side, they are found on the coasts of Newfoundland.

The penguin of the southern seas (*aptenodytes,*) *manchot* of the French, has three toes and a nail behind; the lower part of the bill appears as if mutilated. The members in the place of wings have more the resemblance of fins. In swimming it sinks above the breast, the head and neck alone appearing above water, and its finny wings serving as oars The northern penguin on the contrary swims like most other birds on the surface. This latter is also said to be never met out of soundings, and consequently, that its appearance denotes the vicinity of land. The southern penguin, on the contrary, is found at the greatest distances from land, and frequently on the oceanic ices, which it seems to climb up without difficulty, by the roughness of the soles of its feet.

(Y)—Page 69.

The mean extension of the trade winds towards the equator, in the different months of the year, between the longitude of eighteen and twenty-six, in which space it is usual to cross the line in the passage to and from India, is given as follows in Horsburgh's India Directory.

Months.	Lost the N.E. trade outward.	Got the S.E. trade outward.	Lost the S.E. trade homeward.	Got the N.E. trade homeward.	Mean limits between the trades.
January	7° N.	3° N.	2¼ N.	4¼ N.	3
February	7	1	1½	5	4½
March	5	1½	1	5	3¾
April	6	1½	1	5½	4½

May

Months.	Lost the N.E. trade outward.	Got the S.E. trade outward.	Lost the S.E. trade homeward.	Got the N.E. trade homeward.	Mean limits between the trades.
May	7	3	2½	6	3¾
June	9	3	3	9	6
July	12	3	4	12	8½
August	13	2½	4	13	9¾
September	11½	2	3½	11¾	8¾
October	10	3	3	10	7
November.	9	4	3½	8	4¼
December.	6	4	2½	5½	2¼

(Z)—Page 87.

Both the epoch of the invention, and the inventor of the mariners' compass, are extremely uncertain. The French claim the honour, and found their pretensions on a passage of a poem written in 1200, which they say, contains an allusion to this instrument, under the name of marinette or the mariners' stone, and on a similar allusion in Cardinal Vitry's History of the Crusades, also written in 1200. Others think that Marc Paul brought the first compass from China, in 1260; but it is most generally ascribed to Flevio Giaoa of Amalfi, near Naples, about 1302. The variation was first remarked in the voyage of Columbus; or, according to some, in that of Sebastian Cabot, in 1500. The dip was first noticed by Norman, an Englishman, in 1576.

(Aa)—Page 88.

A series of observations made by Cassini, at Paris, on the diurnal oscillations of the needle, give the following results. From eight o'clock in the morning till two in the afternoon, the direction of the needle approaches the meridian, and then recedes from it till nine in the evening; during the night it remains stationary. The sum of these oscillations towards the west is greater than towards the east. An aberration of the needle of several degrees has also been observed on board ship, in proportion to the angle the ship's head makes with the magnetic pole; being easterly when the ship's head is west, and westerly when it is east; and its quantity is nearly proportionate

to the number of points the ship's head is from the north and south. This oscillation of the needle is not however general, and requires a more regular series of observations than have yet been made, fully to confirm its reality.* The annual increase of the variation at London is very irregular, as appears from the following table. It is however to be observed, that until the year 1800, no great confidence could be placed in the correctness of these data.

1576	11° 15′ E.				
1580	11 11	}	77 ..	years ..	Mean ann. var. $8\frac{2}{3}'$ nearly.
1657	0 0				
1700	8 0 W.	}	40	.....	$11\frac{1}{2}$
1740	15 40				
1750	17 54	.....	10	.....	$13\frac{1}{5}$
1760	19 12	.....	10	.....	$7\frac{1}{5}$
1770	20 35	.....	10	.....	$7\frac{1}{5}$
1780	22 10	.....	10	.....	$9\frac{1}{2}$
1790	23 39	.....	10	.....	8_{10}^{9}
1800	24 2	.....	10	.....	2_{10}^{3}
1810	24 12	.....	10	.....	1

(Ba)—Page 90.

The situation of *Tarshish* and *Ophir* have given occasion to vast research and conjecture. With respect to the former, the opinions of the learned differ as widely as the extremities of the globe. According to some it is *Tarsus* in *Cilicia*, or the island *Thaso* in the Archipelago; others extend the name to the whole of Asia Minor; others pretend it is the isle of Leon near Cadiz, supposed to be also the *Tartessus* of later antiquity.† Carthage, Angola, and even America, have been all brought forward as the *Tarshish* of the Bible, while some believe it to be the general Hebrew name for a distant country, and others again consider it as a denomination for the ocean in general.

The Ophir of Moses (Genesis x, 29) and of Solomon (2 Chron. viii.

* Flinders' paper in the Phil. Tran.

† Others suppose Tartessus to have been an island formed by two ancient branches of the Guadalquivir, one of which has disappeared.

viii, 18) are supposed to be different countries, from the difference in the Hebrew orthography; the former answering to *Oupheir*, and the latter to *Soopheira*, and this is the translation of them in the Septant version of the Bible. The Ophir of Moses (*Oupheir*) is thought to be a country of Arabia Felix, on the Red Sea, while that of Solomon (*Soopheira*) from whence the Phenicians brought gold dust, should be sought for in India. Near the *sinus Barygazenus* (gulf of Cambay) was the ancient city of *Supara* (probably Chitpore), which by some writers is supposed to be the *Soopheira* of the Chronicles.

(Ca)—Page 96.)

Although the veil of fable, with which the ancient poets have clothed the voyage of the Argonauts, has caused its reality to be called in question, its admission by several of the most serious writers of antiquity gives it a claim to a certain degree of credibility. They assure us, that the Argonauts fitted out a fleet to secure to the Greeks the free navigation of the Euxine, by purging it of the pirates that infested it. It also seems probable, that the desire to possess themselves of the riches of the Colchide, was one of the motives of this expedition, and that the fable of the Golden Fleece alluded to the mines of the precious metals, which are known to exist in this country.

(Da) – Page 98.)

This relation is as follows: "When Nechos, King of Egypt, had caused to be finished the canal which conducted the waters of the Nile to the Arabian Gulf (Red Sea), he sent some Phenicians with orders to return by the Pillars of Hercules into the Northern Ocean; they accordingly embarked on the *Erythrean* Sea (the sea of Arabia) and navigated in the Southern Ocean. When autumn arrived, they landed on the part of Lybia they had reached, and sowed corn: here they waited the harvest, and then continued their voyage. Having thus navigated for two years, the third they passed the Pillars of Hercules and returned to Egypt, relating that in sailing round Lybia, they had the sun on their right hand. This relation, continues

Herodotus, seems incredible to me, but perhaps it will not appear so to others." In fact, modern geographers still dispute as to the reality of this voyage. Those who deny it rest chiefly on the fact, that the time assigned to it (three years) was not sufficient to accomplish it in the manner described, and in the then state of navigation. And this part of their reasoning seems to be unanswerable; for, even at this day, it would certainly require eighteen months to coast Africa from the Red Sea to the Strait of Gibraltar, and allowing nine months for each interval on shore between the sowing and the reaping, the Phenicians could not have been more than eighteen months at sea.

(Ea)—Page 102.

Eratosthenes places *Thule* under the polar circle, and his modern adherents think it a part of the north coast of Iceland. Pliny carries it still farther to the north, within three degrees of the Pole. Ptolemy places it between 60° and 62° on the coast of Norway; and his opinion is also adopted by several moderns, from the still existence of a district, called *Thele* or *Thelemark*, on this coast. Procopius supposes Thule to be a general name for all Scandinavia, while Ptolemy assigns it a position answering to the Zetland Islands. Malte Brun supposes it to be a district of the coast of Jutland, at present called *Thyland*, in about 56½° north; for, according to this writer, the sandy downs of Jutland, whose hills shift with the winds, the marshes covered with a crust of sand, in which the imprudent voyager is swallowed up; and the fogs of a peculiar nature, which frequently occur, might, without much extravagance, lead Pytheas to observe, that near Thule the sea, the air, and the earth seemed to be confounded in one element. Moreover, the six days navigation from the north extremity of Britain, the night reduced to two or three hours [by long crepuscles], the culture of millet in the north, and of wheat in the south, the abundance of honey and consequent general use of hydromel, as described by Pytheas, are all more applicable to the peninsula of Jutland than to any other part of the north.

Zeno

(Fa)—Page 115.

Zeno was a Venetian, whom the spirit of adventure caused to quit his country; and in about 1380 he entered into the service of the prince of Friezeland (supposed to be the Ferro islands), and who, according to the relation of his adventures, visited, or at least collected an account of two countries, named *Estotiland* and *Drogeo*, more than 1,000 miles west of Friezeland, which were discovered by a fishing-boat of the latter driven to the west in a storm. The country of Estotiland is described as an island *less* than Iceland, but much more fertile, and of which the inhabitants exercised various trades, understood the art of writing in characters peculiar to themselves, and in the king's library were some Latin books. Though the compass was unknown to them, they traded to Greenland for sulphur, pitch, and furs. South of this island was another country, very large and populous, abounding in gold; here the people sowed wheat, brewed beer, dwelt in stone houses, had a great number of cities and castles, and large forests. In the neighbourhood of Estotiland was a country called *Drogeo;* and another extensive country, of which the inhabitants were Anthropophagi, and so savage that they had not even the idea of covering themselves with the skins of the animals they killed in the chace. A little farther south dwelt another people more civilized, who were acquainted with the precious metals, and had houses and temples, in which they offered human sacrifices to monstrous idols. A recent French geographer* believes Estotiland to be the same country as Winland and Newfoundland, and its civilized inhabitants the descendants of the Greenland colonists. The Latin books, he supposes, belonged to the Greenland bishop, who was sent thither to preach the gospel in 1121. The country of *Drogeo*, according to this supposition, will be Nova Scotia or New England. There are, however, strong objections to be made to the authenticity of this relation of Zeno, which was

* Malte Brun.

only published at Venice by his descendants in 1558, or sixty-six years after the discovery of America by Columbus.

(Ga)—Page 117.

Though the Portuguese have the best authenticated claim to the discovery of the Madeiras, we cannot omit noticing, that this honour has also been accorded to an Englishman, of whose story the following are the outlines.—Robert Macham lived in the reign of Edward III., and although of humble lineage, became enamoured of the beautiful Anne d'Arfert, of a noble and powerful house, whose affections he gained, but her family disdaining the alliance, procured an order from the king to imprison the lover, and obliged the maid to give her hand to a gentleman of Bristol. On Macham's release, he prevailed on his mistress to fly with him to France, and with this intention they embarked; but scarcely was the anchor weighed, when a storm arose, and for fourteen days the vessel drove at the mercy of the winds and waves, when land was seen, which proved to be an island covered with wood. Here the lovers landed with a few of their attendants; but, during the night, a storm forcing the vessel from her anchors, she was wrecked on the coast of Barbary, and the people on board her were made slaves by the Moors. Anne was so afflicted by the loss of the vessel, that she soon died of grief, and Macham shortly followed her to the grave. Their attendants now determined to quit the island, and embarking in the vessel's boat, which remained, put to sea, and after a long series of adventures, some of them fell into company with a Spaniard, to whom they related their story, and who communicated it to Gonzales Zarco, then employed in maritime expeditions in the service of Portugal. Zarco immediately proceeded in search of the island, and arrived at Madeira, which, from the relation of the English, he recognized to be that on which the unfortunate lovers had perished. This story is related by Alfacarado, in a work entitled, *The first Discovery of Madeira*, and is corroborated by a chart of 1384, in which an island is laid down in the situation of Madeira, and called *Isola*

Isola de Leguania, or woody, which is also the signification of Madaira.

(Ha)—Page 117.

There is reason to suppose, that the Azores were discovered half a century earlier; for in a chart of 1380, several islands are found north of the Canaries, whose names seem to identify them with the former, *viz.*—Isle of *Brasil*, or of fire, *Corvos Marinos*, and *St. George*.

(Ia)—Page 133.

Chronological series of Voyages to the North, chiefly in search of the Northern Passage to India.

1495, Voyage of John Cabot, in the service of England.

N.W. 1497, Voyage of the same Cabot, discovered Newfoundland, and visited the coast of America to the Chesapeak.

N.W. 1500, Gortreal discovered Labrador and the Strait of Anian.

N.W. 1527,* 1536, Obscure voyages to the coast near Newfoundland and Cape Breton, from England.

N.E. 1553, Sir Hugh Willoughby discovered Nova Zembla; Chancellor visited the river Dwina.

N.E. 1556, Burroughs tried for a passage through Waygats Strait.

1564, An attempt of the Danes to discover the northern passage.

N.W. 1576, 1577, 1578, Three voyages of Frobisher to the coast of Greenland.

N.E. 1580, Pett and Jackman, in the service of the Russian Company, made an unsuccessful attempt to penetrate through Waygats Strait.

* The first idea of a passage to India, round the North Pole, was suggested by Robert Thorne, of Bristol, in this year.

1584, Barentz sought the passage to the N.E.; one of his ships pretended to have penetrated through Waygats Strait, forty leagues east of the island of the same name, where the sea was found open.

N.W. 1585, 1586, 1587, Three voyages of Davis, discovered the branch of the ocean that bears his name.

N.W. 1593, Weymouth, for the Russian Company, visited the strait, afterwards called after Hudson.

N.E. 1595, The Dutch sent seven vessels to try the passage through Waygats Strait.

N.E. 1596, Heemskirk and Barentz discovered Beer Island and Spitzbergen.

N.W. 1605, 1606, 1607, Danes sent expeditions to the coast of Greenland.

N.W. 1606, English Russia Company sent Knight to the N.W.

N.W. 1607, The same Company sent Hall for the same purpose.

N.W. 1607, 1608, 1609, 1611, Four voyages of Hudson to the N.W.; discovery of his Strait.

N.W. 1612, Button sent by the Russia Company to seek for Hudson; discovery of Hudson's Bay.

N.W. 1614, Two voyages, first of Gibbons, second of Fotherby and Baffin, to the N.W.

N.W. 1615, Second voyage of Fotherby and voyage of Billot and Baffin.

N.W. 1616, Second voyage of Billot and Baffin; discovery of Baffin's Bay.

N.W. 1619, Danish voyage, commanded by Monk, into Hudson's Bay.

N.W. 1631, Fox and James sought a passage through Hudson's Bay.

N.E.

N.E. 1676, Wood and Hawes sought the passage between Nova Zembla and Spitzbergen.

N.W. —— Several attempts of the Hudson's Bay Company.

N.W. 1736, H.M.S. Furnace and Discovery try for the passage in Hudson's Bay.

N.W. 1746, 1761, 1762, Hudson's Bay Company sent ships into the bay to seek the passage.

1769, Hearn traversed the continent of America.

1773, Voyage of Commodore Phipps into the Frozen Ocean.

1778, Third voyage of Cook to seek the passage from the Grand Ocean.

1789, M'Kenzie traversed the American continent.

1791, Voyage of Vancouver to the N.W. coast of America.

(Ka)—Page 155.

Between 1769 and 1772, Mr. Hearn traversed the continent from Fort Prince of Wales, in Hudson's Bay, to the mouth of the Copper Mine river, which he found empty itself into a boundless expanse of waters, in latitude 72° and longitude 114° west. The tide being out when he reached this spot, the water was fresh; but he concluded he had the sea before him, from the quantity of whales and seals' bones he observed near some Esquimaut huts. A number of islands were scattered over the water to the limits of the horizon.

In 1789, Mr. M'Kenzie travelled from Fort Chepuvau to the mouth of a river to which he gave his name, and which empties itself into what he concluded to be the sea, from seeing several whales in 169° 14', longitude 135° west.

(La)—Page 160.

Before the perfection of navigation had opened to Europeans the farthest extremities of the globe, the people who inhabit the shores of the ocean frequented by the greater cetaceous animals waged war against them, employing either force or address as their

their means were more or less efficient. The Greenlander, whose existence, in a great measure, depends on the success of his whale hunting, knows from experience the exact time when these animals will appear on the coast, and prepares for it. This moment arrived, he embarks with his wife and children, and never returns without an abundant provision of both flesh and fat, and even with the laminæ of the mouth or whale-bone which he contrives to wrench out; for doing which, the European fishers have powerful instruments constructed expressly. The Greenlanders transfix the whale with harpoons, to which are attached bags of seal-skin filled with air, two of which are said to be sufficient to prevent the unwieldy animal from going down. The N.W. Americans also use air-bags in the same manner. The Kamtschadales and Kuriles, less enterprising, dare not attack these animals while awake; but when they find them slumbering on the surface, they approach silently, and transfix them with poisoned arrows. This cowardly method does not, however, always secure to the striker the animal he destroys; for though the effect is generally mortal, the fish often gets out to sea before it operates. Amongst the Caroline islands, when the natives observe a whale enter into one of the sounds between the islands, some hasten to block the channels with their canoes, while others approach the fish, and frighten him into shoal water until he runs aground, when they dispatch him with their spears.

It would appear, that the *Basques* (inhabitants of Biscay) were the first Europeans who sought the whales in their northern retreats, about the end of the fifteenth or beginning of the sixteenth century. Towards the close of the latter, the English first attempted this fishery; for, according to Hackluyt, in 1571 "we sent to Biscay for persons capable of taking whales and extracting the oil, and even for carpenters to set up the casks." The Basques, to whom we were thus obliged for teaching us this business, either losing their spirit of enterprise or unable to support the concurrence, ceased to visit the northern seas towards the middle of the seventeenth century.

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The Dutch, in their turn, by economy and perseverance, first rivalled the English in this fishery, and at last monopolized it; for, in 1765, when England had not a single ship thus employed, Holland had upwards of 150, and supplied three-fourths of Europe with fish-oil.

The Hamburgers, Danes, Swedes, and Prussians attempted to share with the Dutch the profits of the whale fishery: the Danes from Bergen, the Swedes from Gothenburg, and the Prussians from Embden; and all with a sufficient degree of success to induce them to continue it.

The revival of the whale fishery in England was due to an individual ship-owner of Hull, who, without any encouragement from government, for several years succeeding 1766 sent one or more vessels into the Greenland Seas, whose voyages proving successful, produced a general emulation amongst the merchants of the principal seaports; and the premiums and other encouragements granted by government since 1779, have again raised the whale fishery to be one of the most profitable and best followed branches of national industry.

Between 1744 and 1766 France sent only two ships to the Greenland Seas, whose voyages turned out so unsuccessful that the speculations were again dropped until 1784, when the government attempted to renew them; and between 1784 and 1791 some expeditions were made from Dunkirk, chiefly manned by Americans from Nantucket, the benefits of which were inconsiderable.

The vessels destined for the northern whale fishery should time their departure from port so as to arrive in the latitude of 77° to 79° in the month of April, when the whales are most abundant in these parallels. When arrived at this station the ship heaves to, and hoists out her boats. The moment a whale is seen, the boats pull for it, and when within twelve or fifteen feet, the harpooner, who stands in the bow, darts the weapon into it. The animal on feeling the wound instantly dives, either perpendicularly or obliquely, and carries out 350, and even sometimes 1,000 fathoms of line, which it is the business of the line manager

manager to veer out, while another person stands ready with an axe to cut it, should it get entangled. When the animal begins to draw out the line with less velocity, the boatmen check it occasionally, and are often obliged to play him for hours. When so weakened as to make little resistance, they draw him to the surface, and drive spears into him, which soon finishes him by loss of blood; they then make fast ropes to the tail and fins, and tow him alongside the ship, where the tail being cut off to render him more manageable, a large hook is fixed in the mouth, and ropes rove through holes cut in his blubber, by which he is just hoisted out of the water, and the stripping off the blubber commences. The instrument used for this purpose is a sharp blade two to three feet and a half long, fixed into a wooden handle three or four feet in length; the soles of the boots of the persons employed in this office have iron plates with points to prevent their slipping on the skin of the animal. The blubber is cut out in squares of four or five feet, which are hoisted into the vessel with hooks; and when one side is stripped the animal is turned by means of tackles. The squares are divided into four or five pieces and thrown into the hold. When all the blubber and jaws are on board the carcase is sent adrift; the pieces of blubber are then freed from their ligaments and flesh, and are cut into morsels to enable them to enter the bung-holes of the casks. The whole of these operations are performed without the persons touching the blubber with their hands, for it is thought that the contact, or even too near approach of this substance causes contractions of the nerves, producing the loss of the use of the hands and arms.

When a boat strikes a fish, she hoists a flag as a signal of possession, and the ship to which she belongs hoists her ensign; after which, though the first boat should be obliged to cut the line, no other has a right to strike the fish. A good fish affords sixty to 100 barrels of oil.

The whalers are often obliged, when among the ices, to make fast to them, in order to prevent driving on those to leeward. For this purpose they are furnished with ice anchors, shaped like

an

an *f*, one crook of which is considerably larger than the other; the large crook is fixed in a hole made in the ice, and to the other end is attached to a hawser from the vessel, the length of which is seldom more than fifteen fathoms, so that the bowsprit nearly projects over the ice. When there is danger of the ices enclosing a vessel, and damaging her by their pressure, the only prevention is cutting a dock for her in one of the masses, which is done by means of large saws. In order to resist the concussions of the ice the vessels are usually doubled and extra-timbered at the bows and stern.

(Ma)—Page 164.

These remains of quadrupeds, whose genera are now only met in the temperate or torrid zones, being found in such quantities at the extremity of the frozen zone, is a singular fact in natural history, and has given rise to many conjectures, of which the most out of the way is that of Bayer, who supposes them to have belonged to the animals that accompanied the Tartar armies. Pallas refers them to the deluge; but they present no appearance of a long and violent rolling: on the contrary, the state of perfection in which they are met, even the skin, hair and flesh being preserved, proves them to have lived and died in these regions. But to admit this, it seems to follow, that these countries, now so cold and sterile, must have been then temperate and fertile; and this supposed change of temperature has been accounted for by the hypothesis of the gradual refrigeration of our planet, by a change in the position of the earth's axis, or in the obliquity of the ecliptic. The Buffonian theory of the loss of heat, is, however, exploded; and the change in the astronomical position of the globe is denied, both by astronomers and geometricians. It is, in fact, evident that these animals, of which the remains are found so perfect, must have been frozen at the moment of their death, otherwise they would have been quickly decomposed by putrefaction; and, consequently, that, if a change of climate has taken place, it must have been instantaneous. Mr. Cuvier infers from the nature of the hair and wool that covered the elephant found on the banks of a river

river of Siberia in a perfect state, that this species was calculated to live in a cold region; and another solution of the question has been offered in the supposition, that these animals fed on the fish of the sea, or large rivers, near which their remains are found. The nature of the soil that covers these remains proves that the catastrophe which deprived them of life, was a transient marine inundation. The tusks of the mammoth differ from those of the present species of elephant in being spiral, forming a circle and a half.

(Na)—Page 173.

The origin of basaltes has been the subject of much learned discussion, some supposing it a christallization of water; others, a species of lava; while naturalists of the present day seem inclined to ascribe its formation to the combined effects of fire and water. The most remarkable assemblages of basaltic columns are, the Giant's Causeway, in Ireland, and the Isle of Staffa, one of the Hebrides.

(Oa)—Page 194.

There is scarcely any point of the coast of Norway, except the West Fiord, which the cod have not deserted at different times. This gulf has on the contrary retained its celebrity uninterrupted since the reign of Harold Haarfager in the ninth century. This advantage it probably owes to its repose, whence the fish, who at spawning time require tranquillity, prefer it at this time, when alone they visit it. They collect in millions on two or three banks, between January and March, and the fishing season is over by April, the fish then returning to the ocean. Formerly the Nordlanders used lines only in this fishery, but of late years nets have become general.

(Pa)—Page 223.

In common seasons the principal ports of Russia open and close as follow:

	Opens.	Closes.
Reve	Febr.....March	Novemb ... December.
Riga	March..April	October...November.

Pernau

	Opens.		Closes.
Pernau	Febr.	April	November . December.
Arensburg	Febr.	March	November . December.
Habsal	Febr.	March	November . December.
Balticport	Febr.	March	November . December.
Narva	April		October . . . November.
St. Petersburg	April	May	October . . . November.
Wyborg	April		October . . . November.
Frederickshaven	April		October . . . November.

(Qa)—Page 247.

The chemical qualities of amber, which seem to place it among the resinous gums, as well as the insects found inclosed in it, have induced naturalists to consider it as the exudation of a tree impregnated with mineral vapours; but as the copal is the only gum known to resemble amber, and as this gum is brought to us from Africa and the East Indies, it seems to follow, that, if we admit the ancient existence of trees of the same species in the countries of the Baltic, we must at the same time suppose a great change in the climate. Though the Prussian territory affords the greatest and most certain harvest of amber, this substance is also met with on all the south coasts of the Baltic, from Holstein to Livonia, on the west coast of Jutland and Island of Ameland, in the Asturias (Spain) in veins of coal, on the east coast of Sicily, near Genoa and Ancona, &c.

(Ra)—Page 261.

The following notice of the route from Petersburg to Kiachta will enable the reader to trace it with facility on the map:

From Petersburg, ascend the Neva and enter the Canal of Ladoga;

By the Canal of Ladoga to the River Wolchow;

Ascend the Wolchow to Lake Ilmen, and from this lake into the River Msta, or by the Canal of Novogorod, from the Wolchow to the Msta;

Ascend the Msta to Lake Mstinskoja;

From Lake Mstinskoja into the Schlina;

Ascend

Ascend the Schlina to the Sna;

Ascend the Sna into the Canal of Wyschney Wolotschock;

From the Canal of Wyschney Wolotschock into the Twerza;

Descend the Twerza to the Wolga;

Descend the Wolga to the Kama;

Ascend the Kama to the mouth of some one of the tributary rivers of the Uralian Mountains;

Ascend one of these tributary rivers (generally the Tchous-Sovaya) to the foot of the mountains, where the merchandize is unloaded and conveyed across them on carts or sledges: this carrying place is fifty to sixty wersts:

The merchandize being re-embarked on one of the rivers that descend from the eastern side of the mountains, *viz.* the Tanda, Issel, &c. descend to the Tobol;

Descend the Tobol to Tobolsk, where the Irtish is entered;

Descend the Irtish to the Oby;

Ascend the Oby to the Kett;

Ascend the Kett to within sixty wersts of the town of Jenesseisk, where the merchandize is unladen to be conveyed by land to that town, where it is embarked on the Jenessei;

Descend the Jenessei to the Tongouska;

Ascend the Tongouska and Angara, which are properly the same river, and passing through Irkoutsk, enter Lake Baikal, which is very stormy and dangerous; from this lake enter the Selenga;

Ascend the Selenga to the Mangoulia;

Ascend the Mangoulia to a little river that runs close to Kiachta.

TABLE I.

MONIES, WEIGHTS, AND MEASURES,

Of the Countries described in this Volume.

SWEDEN.

Monies.

3 rundsticks .. 1 stiver.
4 stivers .... 1 schilling.
48 schillings .. 1 rix dollar.
94 schillings .. 1 gold ducat.

Merchants' accounts are kept in dollars and schillings. The par of exchange between Stockholm and London is 4½ rix dollars, £1 sterling.

Weights.

4 quintin .... 1 lot.
32 lots ..... 1 scholpund.
20 scholpund .. 1 lispund.
20 lispund .... 1 scheppund.

The scholpund common market weight is 15oz. English, 100 scholpund being 93lb. 7oz. aveird.

Long Measure.

12 straas or lines .... 1 inch.
12 inches .... 1 fot or foot.
100 foot Swedish = 97 ft. 2¼in.

Dry Measure.

4 stoppes .... 1 firtle.
4 firtles..... 1 span.
2 spans ..... 1 tun.
12 tuns of dry goods, 18 tuns of salt .... } 1 last.
1,000 fish, 1 tun of herrings.

Liquid Measure.

2 stoppes .... 1 kan.
15 kans ..... 1 anker.
2 ankers .... 1 embar.
2 embars .... 1 ahm.
1½ ahm ..... 1 oxhov.
2 oxhoved.... 1 pipe.
2 pipes ..... 1 fuder.
100 kans = 82¼ gallons English.

DENMARK, NORWAY, AND ICELAND.

Monies.

16 schillings .. 1 marc.
4 marcs .... 1 dollar.
6 marcs .... 1 rix dollar.

The merchants' accounts are kept

kept in rix dollars, marcs, and schillings. Copenhagen gives 6 rix dollars 30 schillings for £1 sterling on London.

Weights.

4 quintins.... 1 lot.
2 lots ..... 1 ounce.
16 ounces .... 1 pund.
16 pund ..... 1 lispund.
20 lispund .... 1 scheppund.
100 pund Danish = 111¾lb. English.

Long Measure.

Same denominations as Sweden.

100 feet Danish = 102 feet 10⅗ in. English.

Dry Measure.

4 quarterons.. 1 skioppe.
8 skioppes.... 1 tun.
22 tuns ..... 1 last.

The skioppe is equal to one bushel.

The tun of corn 36 gallons.
of salt 44
of pitch 30

Liquid Measure.

2 pots ..... 1 kan.
3¾ pots ..... 1 stoop.
10 stoops .... 1 anker.
4 ankers .... 1 ahm.
6 ahms ..... 1 fuder.

The pot is equal to the Engl[i] quart.

RUSSIA.

Monies.

2 poluska.... 1 denusca.
2 denusca.... 1 copec.
2 copecs .... 1 groska.
3 copecs .... 1 altin.
5 copecs .... 1 patoc.
10 copecs .... 1 grivenck.
5 grivencks .. 1 poltina.
2 poltinas, or
100 copecs .... 1 ruble.

Merchants' accounts are kept in rubles and copecs. Petersburgh gives 8 rubles, 57 or 58 copecs, for the £1 sterling on London.

Weights.

3 solitnick.... 1 lot.
32 lots ..... 1 pund.
40 pund ..... 1 pud.
10 puds ..... 1 berkovitz.

The pud is 36lb. English.

Long Measure.

16 verschoks .. 1 archine.
3 archines.... 1 sagene.
500 sagenes .... 1 werst.

The archine is 28¼ inches.

The werst and half, one English statute mile nearly.

Dry Measure.

2 tschetwerck 1 pajak.
2 pajaks ..... 1 palosmina.
2 palosmina.. 1 tschetwert.

The

The tschetwert weighs 9½ puds, and is equal to 5¼ Winchester bushels.

Liquid Measure.

11 tscharka.... 1 kruska.
4 kruska .... 1 vedro.
4 vedron .... 1 browska.

The vedro is 13 quarts English. The oxfod is 18½ vedron or 6 ankers.

PRUSSIA.

Monies.

18 pfennings .. 1 grosche.
30 groschen .. 1 guilder.
3 guilders.... 1 rix dollar.

The merchants' accounts are kept in guilders and groschen. Konigsberg, Memel, &c. give 20 guilders for £1 sterling on London.

Weights.

16 ounces .... 1 pound.
33 pounds .... 1 stone.
10 stone ..... 1 schoppund.
60 schoppund.. 1 last.

100lb. Prussian 105lb. English.

Long Measure.

The foot of 132 . 2 lines English.

100 Prussian feet = 91 . 8 English.

DANTZIC.

Monies.

6 pfennings .. 1 schilling.
3 schillings .. 1 grosche.
30 groschen .. 1 florin.
4 florins .... 1 rix dollar Prussian.

The merchant's accounts are kept in florins and groschen, 23 to 24 florins being given for the £1 sterling on London.

Weights.

8 ounces .... 1 mark.
2 marks..... 1 pound.
16½ pounds.... 1 lispund.
20 lispunds.... 1 scheppund.
99 Dantzick pounds = 95lb. English.

MECKLENBURG.

Monies.

32 schillings .. 1 zweeg drittel.
48 schillings .. 1 dollar.

LUBECK.

Monies.

12 pfennings .. 1 schilling.
16 schilling .. 1 mark.
3 marks .... 1 rix dollar, current.
54 schillings .. 1 rix dollar, specie.

Weights.

8 ounces .... 1 mark.
2 marks..... 1 pound.
10 pound..... 1 stone of wool or feathers.
20 pound..... 1 stone of flax.
16 pound..... 1 lispund.
8 lispund .... 1 centener
20 lispund .... 1 scheppund.
104lb. Lubeck = 112lb. English.

EMBDEN.

Coins.

2 oits ..... 1 sey fert.
2 sey ferts.... 1 stiver.
2 stivers .... 1 schoff.
1½ schoff .... 1 flinderke.
2 flinderkes .. 1 schilling.
3 schillings .. 1 mark.
4 marks..... 1 specie dollar.

The merchants' accounts are kept in rix dollars, stivers, and wittens. The rix dollar = 54 stivers or 540 wittens.

Weights.

16 ounces .... 1 pound.
21 pound Embden = 23 pound English measure.
73 feet Embden = 71 feet English.

HOLLAND.

Monies.

8 duyten .... 1 stuiver.
1½ stuiver .... 1 dubbeltje.
3 dubbeltjes .. 1 schilling.
10 ——— .. 1 florin.
15 ——— .. 1 dollar.
25 ——— .. 1 rix dollar.

Merchants' accounts are kept in florins and stuivers. Amsterdam gives 11 florins the £1 sterling on London.

Weights.

16 ounces .... 1 pound.
8 pound .... 1 stone.
15 pound .... 1 lispund.
20 lispund .... 1 scheppund.
91½lb. Holland = 100lb. English.

Long Measure.

24 quarts .... 1 inch.
11 inches .... 1 foot.
100 foot Holland = 86 feet, 10 inches, English.

Dry Measure.

4 scheepels .. 1 mudde.
27 muddes.... 1 last of corn.

Liquid Measure.

2 pints ..... 1 mingle.
2 mingles .... 1 stoop.
8 stoopen .... 1 stekenneu.
2 stekenneu .. 1 anker.
4 ankers .... 1 acm.
200 mingles .... 1 oxhooft.

HAMBURGH.

HAMBURGH.

Monies.

Almost all the coins of Europe circulate at Hamburgh, where the business of exchanging one for another is an extensive and profitable trade.

The accounts are kept in marks, schillings, and pfennings, reckoning the mark at 16 schillings, and the schilling at 12 pfennings: a rix dollar is 3 marks. Hamburgh gives 34 schillings, 4 pfennings, the £1 sterling on London.

Weights.

16 ounces .... 1 pound.
14 pound..... 1 lispund.
20 lispund .... 1 sheppund.
104lb. Hamburgh = 112lb. English.

Long Measure.

33 Hamburgh feet = 31 English.

The Hamburgh last of grain, is 83 Winchester bushels.

TABLE II.

COMPARATIVE LINEAL MEASURES.

	Lines.	Feet.	Inches.	Decim.
The English foot	144	1	–	–
Amsterdam voet	133½	–	11	136
Arabian cubit.....		2	1	9
Bremen fuss	138	–	11	5
Cadiz pié	133·3	–	11	130
China che	144	1	–	63
—— merchant's foot	160	1	1	33
—— pu		6	3	816
Constantinople pic.....		2	4	–
Copenhagen fod.....	148⅓	1	–	348
Dantzick fuss.....	132·2	–	11	844
Flanders ell		2	7	392
France pied du Roi	155	1	–	789
—— aune		3	10	512

	Lines.	Feet.	Inches.	Decim.
France toise, 6 feet fr.....	–	6	4	734
—— metre.....	–	3	3	3702
Genoa palmo.....	118·4	–	9	83
—— canna	–	7	3	60
Hamburgh fuss.....	135·5	–	11	29
Lisbon palmo.....	133·3	–	11	130
—— vara	–	2	9	390
Lubeck fuss.....	137	–	11	42
Malta palmo.....	123·8	–	10	436
Massina palmo	114	–	9	5
Naples palmo.....	123·8	–	10	436
—— canna.....	–	6	10	90
Norway fod.....	148·$\frac{3}{8}$	1	–	348
Rome palmo	138·6	–	11	6
Russia, foot	144·	1	–	–
—— archine.....	–	2	4	24
Sardinia palmo	117·3	–	9	77
Siam sok.....	225·	1	6	7
Smyrna cubit.....	–	2	2	444
Sweden fot.....	140	–	11	66
Venice palmo.....	163·3	1	1	58

TABLE III.

COMPARATIVE ITINERARY MEASURES.

The English road or statute mile.....	5,280 feet.
The marine league	3 miles.
The horary or geographic league	3·46 miles.
The degree of the meridian 20 leagues....	69·2 miles.

	English miles.	Number in a Degree.
Austrian league.....	7·3	9·5
Brasil.....	4·7	17·0

Cayenne

	English miles.	Number in a Degree.
Cayenne league	2·47	28
Canada	2·42	28·54
Carnatic	1·97	35
China li	·035	192·4
Coromandal gros	6·29	11
Denmark mile	4·68	14·77
Flanders	2·76	25
France—post league 2,282 toises	2·76	25
Marine league 2,835 toises	3·43	20·17
Myriametre	6·214	11·846
German meile	4·6	15
Modern Greece mile	·801	86
Hindostan cos	1·65	42·75
Ireland mile	1·73	40
Iceland sea mile	7·69	9
land mile	5·77	12
Naples lega	1·24	57·71
Norway mile	6·92	10
Poland league	3·46	20
Portugal lega	3·82	18·1
Prussia meile	4·81	14·37
Russia werst	0·664	104·2
Siam, Roe-ning	2·39	28·942
Spain legua Nueva	4·14	16·7
Horaria	3·46	20
Common	2·76	25
Sweden meile	6·68	10·36
Turkey berri	1·033	66·75
Venice mile	1·14	60·62

TABLE IV.

Comparative Value of coined Monies, according to the English Mint Price of Silver, 5s. 2d. per Ounce.

	£.	s.	d.
Austria.			
Florin or gilder...	0	2	1 20
Species rix-dollar	0	4	2 40
Double golden sovereign.....	1	9	6
Holland.			
Florin current...	0	1	9
Rix-dollar current	0	4	4 54
Silver ducaton ...	0	5	6 50
Gold ducat	0	9	8
Gold Ruyder	0	1	6
Denmark.			
Species rix-dollar	0	4	6 72
Christian d'or....	0	17	4
France.			
Franc	0	0	9 79
Livre tournois....	0	0	9 54
Genoa.			
Lira	0	0	8
Zechino	0	9	10
Naples.			
Ducato regno....	0	3	4 80
Ferdinand d'or ..	1	1	4
Portugal.			
Milre	0	5	8 75
Crusado	0	2	3 50
Dobras	3	14	11 70
Dobraons	7	0	1 50

	£.	s.	d.
Prussia.			
Florin or gilder ..	0	1	0
Rix-dollar	0	3	0
Frederick d'or....	0	17	1 40
Rome.			
Paolo	0	0	5 30
Scudo	0	4	4 05
Russia.			
Ruble	0	3	2 50
Ragusa.			
Visline	0	2	11
Sardinia.			
Lira	0	1	6 21
Scudo	0	3	10
Carlino	2	0	10
Sicily.			
Scudo	0	4	1 40
Ounce.....	0	10	2 54
Spain.			
Real of old plate..	0	0	4 93
Real of new plate	0	0	5 24
Real vellon.....	0	0	2 62
Peceto	0	0	10 48
Piastre (dollar), since 1772	0	4	4 50
Gold pistole	0	17	3
Gold escuditto ...	0	4	5

Sweden.

Sweden.	£.	s.	d.
Rix-dollar	0	4	7 41
Ducat	0	9	7
Tuscany.			
Lira	0	0	8 10
Francescooni	0	4	8 70
Zechino	0	9	10
Rusponi	1	9	8

Turkey.	£.	s.	d.
Piastre	0	1	1 12
Zair Mahoub	0	5	4 50
Fonduc	0	7	10 70
Venice.			
Lira	0	0	4 25
Scudo	0	5	5
United American States.			
The Dollar	0	4	6

TABLE V.

Correspondence of the ancient Epochs with the Christian Era, 1814.

	Years.
Year of the Julian period	6526
Since the first Olympiad	2588
Since the foundation of Rome	2567
The epoch of Nabonassar	2561

The year 1229 of the Turkish hegira commenced the 4th January, 1814.

TABLE VI.

Names of the principal Winds, ancient and modern.

ANCIENT NAMES.

Boreas, Aparctias, Septentrion	North.
Meses, Aquilo	N.E. by N.
Cæcias	N.E.
Apeliotes, Subsolanus, Eurus	East
Euronotus, Vulturnus	S.E.
Notos, Auster	South.

Libonotus,

Libonotus, Libophœnix	S.W. by S.
Libs, Africus	S.W.
Zephyrus, Favonius	West
Corus, Skiron, Argestes, Iapix	N.W.
Thracias, Cercias	N.W. by N.

MODERN NAMES.

English.	*French.*	*Italian.*
North	Nord	Tramontana
N. by E.	N. ¼ N.E.	¼ di Tra.-verso Greco
N.N.E.	N.N.E.	Greco-Tramontana
N E. by N.	N.E. ¼ N.	¼ di Greco verso Tramon
N.E.	Nord Est	Greco
N.E. by E.	N.E. ¼ E.	¼ di Greco verso Levante
E.N.E.	E.N.E.	Greco-Levante
E. by W.	E ¼ N.E.	¼ di Levante v. Greco
East	Est	Levante
E. by S.	E. ¼ S.	¼ di Levante v. Scirocco
E.S.E.	E.S.E.	Levante-Scirocco
S.E. by E.	S.E. ¼ E.	¼ di Scirocco v. Levante
S.E.	Sud Est.	Scirocco
S.E. by S.	S.E. ¼ S	¼ di Scirocco v. Ostro
S.S.E.	S.S.E.	Ostro-Scirocco
S. by E.	S. ¼ S.E.	¼ di Ostro v. Scirocco
South	Sud	Ostro
S. by W.	S. ¼ S.O.	¼ di Ostro v. Libeccio
S.S.W.	S.S.O.	Ostro-Libeccio
S.W. by S.	S.O. ¼ S.	¼ di Libeccio v. Ostro
South West	Sud Ouest	Libeccio
S.W. by W.	S.O. ¼ O.	¼ di Libeccio v. Ponente
W.S.W.	W.S.W.	Ponente-Libeccio
W. by S.	O. ¼ S.O.	¼ di Ponente v. Libeccio
West	Ouest	Ponente
W. by N.	O. ¼ N.O.	¼ di Ponente v. Maestro
W.N.W.	O.N.O	Maestro-Ponente
N.W. by W.	N.O. ¼ O.	¼ di Maestro v. Ponente
N.W.	Nord Ouest	Maestro

English.	*French.*	*Italian.*
N.W. by N.	N.O. ¼ N.	¼ di Maestro v. Tramont.
N.N.W.	N.N.O.	Maestra-Tramontana
N. by W.	N. ¼ N.O.	¼ di Tramont. v. Maestro
North	Nord	Tramontana.

The Dutch, Danish, Swedish, and German names of the Winds differ little in the pronunciation from the English. The Italian names are in general use throughout the Mediterranean.

TABLE VII.

Comparative Scales of Thermometers in use among different Nations.

In Farenheit's thermometer, generally used in England, the space between the points of congelation and ebullition is divided into 180 parts; and as it was supposed, that the greatest cold is produced by mixing snow and muriate of soda or common salt, this point is made zero; the point of congelation is, therefore, 32°, and of ebullition 212°.

In the thermometer of Reaumur used in France, the point of congelation is made zero, and the scale between it and the point ebullition is divided into eighty degrees.

In the thermometer of Celsius, or the Centigrade, used in Sweden, the scale between the points of congelation or zero and ebullition is divided into 100°.

In the thermometer of Delisle, used in Russia, the graduation commences at the point of ebullition, and increases to that of congellation, which is 150°.

To convert degrees of Reaumur to those of Farenheit, the rule is multiply by nine, divide by four, and add thirty-two to the quotient.

To convert the degrees of Celsius to those of Farenheit, multiply

multiply by nine, divide by five, and to the quotient add thirty-two.

To convert the degrees of Delisle below the point of ebullition to those of Farenheit, multiply by six, divide by five, and from the quotient subtract 212, or subtract the quotient from 212.

To convert the degrees of Delisle above the point of ebullition, multiply by six, divide by five, and to the quotient add 212.

The following scale of heat is according to Farenheit:

Mercury and linseed oil boil	600°
Lead melts	540
Tin melts	408
Milk boils	213
Water boils	212
Brandy boils	190
Wax melts	142
Greatest heat of the atmosphere in the shade	111
Mean heat of the human body	95
Greatest heat of the surface of the sea under the Equator	80
Butter melts	74
Vitriolic acid freezes	45
Heat of animals in a torpid state	39½
Water freezes and snow melts	32
Milk freezes	30
Vinegar freezes	28
Human blood freezes	25
Brandy, or a mixture of equal parts of pure spirits and water freezes	7° below O
Spirit of wine freezes	34
Mercury freezes	39 or 40
Greatest cold produced by a mixture of vitriolic acid and snow	69

OF THE BAROMETER.

Experience having proved that a great degree of dependance may be placed in the indications of the barometer with respect to any considerable change of weather, the following observations may not be useless.

1. The rising of the barometer presages fair weather, and its falling, rain, snow or storm.

2. In hot weather the falling indicates thunder.

3. In winter the rising indicates frost, and in frosty weather the falling portends a thaw; but, if the mercury is rising during a continued frost, a fall of snow may be expected.

4. When bad weather happens shortly after a fall of the mercury, it will be of short duration; and fair weather succeeding to bad immediately after a rise, will not long continue.

5. In fair weather, when a considerable fall takes place before a change, much rain, or a violent gale, may be looked for.

6. In bad weather, when the mercury continues to rise for some time before it is over, a length of fair weather may be expected to succeed.

There is little variation of the barometer between the tropics, for the winds blowing generally in the same direction, and with equal force, there are no contrary currents of air to cause any considerable change in the density of the atmosphere. In great storms or hurricanes, however, within the tropics, the barometer falls very low, but soon returns to its settled state. Captain Flinders, in his Survey of New Holland, observed the barometer to be affected by the wind as it blew from the sea or land; the mercury rising on the approach of the sea breeze, and falling previous to the arrival of the land wind. Mr. Horsburgh, in a continued series of observations, ascertained an equitropical diurnal rise and fall of the barometer at sea; the mercury falling from noon till four in the afternoon, when it reached the lowest point of depression; from between four and five it again rose till nine or ten, at which time it had reached the highest point of elevation, and continued stationary till midnight; after which it fell until four A.M. when it was again as low as it had been at four P.M.; but from this time it rose till seven

seven or eight o'clock, when it reached the highest point of elevation and remained stationary till noon. On land these variations were so trifling as to be scarcely perceptible.

TABLE VIII.

Table of the Elevations of the principal Mountains of the Globe above the Level of the Sea.

Europe.

	Feet.
Mont Blanc, Alps	15,860
Mont Perdu, Pyren.	11,283
Etna	10,963
Mont Rotunda, Corsica	8,694
Mont Velino, Appen.	7,878
Swicku, Norway	6,658
Snæfial, Iceland	6,860
Mont d'Or, France	6,707
Areskutan, Sweden	6,180
Serra del Mahao, Portugal	5,500
Ben-nevis, Inverness	4,380
Vesuvius	3,900
Snowden, Wales	3,568
Mackgillicuddys Reeks, Ireland	3,404
Mount Athos, Turkey	3,353

Africa.

Mount. of Abyssinia	15,000
Mount. of Atlas	12,000
Newveldt Mountains, territory Cape of Good Hope	10,000
Table Mountain	3,582
Peak of Teneriffe	12,236

	Feet.
Ambotismene, Madag.	11,500
Gros Morne, Isle of Bourbon	10,883
Pico, Azores	8,240
Island Madeira	5,162
Diana's Peak, St. Helena	2,692

Asia.

Highest peak of Thibet	25,000
Petcha, Chinese Tart.	15,000
Altaic Chain, Siberia	10,735
Mount Lebanon	9,529
Mount Arrarat	9,500
Chain of Olympus	6,500
Chain of Mount. Ida	4,960
Mount Carmel	2,000
The Ghauts, Hindos.	3,000
Mount Ophir, Sumatra	13,842
Mount Egmont, New Zealand	11,000
Mount Parmesan, Banca	10,000
Peak of Jesso	7,680
Behring's Isle	6,000
Elburs, the highest peak of Caucasus	

America.

America.

	Feet.
Chimboraço, Andes.	20,909
Maria Nevada de Merida, N. Granada	16,420
Volcano of Popocatepee, Mexico	16,365
Mount St. Elias, N.W coast	12,672
Mount Fair Weather	8,972
Mount Edgecumbe	1,281
White Mount. New Hampshire, United Stat.	7,800
Apalachian Chain	2,700
Blue Mountains, Jamaica	7,431
Mount Pelée, Martinique	5,700
Mount Garon, Isle St. Vincent	5,050
Mount Misery, St. Christopher	3,711
Black Point, Spitzberg.	4,500
Blaaserk, Greenland	6,000

Height of the inferior Limits of perpetual Snow.

	Feet.
Under the equator	15,860
Latitude 20°	15,000
Latitude 45	8,036
Latitude 65	4,918

Height of some inhabited Places.

	Feet.
Farm of Antisana, Peru	13,445
City of Quito	9,534
City of Mexico	7,465
Hospital of St. Gothard	6,800
Briançon, France	4,285
Palace of St. Ildephonso, Spain	3,820
Madrid	1,993
Geneva	1,216
Moscow	984
Vienna	511
Paris, first stage of the observatory	240
Rome, capitol	150
Berlin	131
London	87

TABLE IX.

TABLE OF GEOGRAPHICAL POSITIONS.

Place.	Latitude	Longitude.	Place.	Latitude	Longit.
Siberia.	North.		*W. Coast, Norway.*	North.	East.
N. Cape of Asia..	68° 56′	179° 90′ W.	Cape Lindesnez...	57° 59′	7° 0′
Cape Barrenoi....	69 33	168 54 E.			
Spiral Bay.....	69 27	167 50	Christiania	59 55	10 52
Mouth of Kovyma River...	69 20	166 10	*Sweden.*		
Mouth of Krestova River.....	70 0	163 40	Gothenburg.....	57 42	11 58
Cape Svatoi.....	71 10	140 30	Carlscrona	56 10	13 54
Mouth of Lena R.	71 30	127 0	Stockholm	59 20	18 4
Cape Cevero Vostoschnoi	75 0	107 38	Gefle.....	60 40	
			Torneo	65 51	24 14
White Sea.			*Finland.*		
Cape Kanyn, ent. White Sea	68 37		Abo	60 47	22 14
			Wyborg.....	60 42	28 46
C. Woronin, Bonaventura	66 30	42 55	*Russia.*		
Archangel.....	64 32	40 28	Petersburg	59 56	30 19
Onega.....	63 53	37 54	Cronstadt.....	60 0	29 49
Solvetskoi convent	65 0	35 51	Narva	59 23	28 14
Cape Poukh Mawolok.....	65 58	34 28	Revel.....	59 26	24 11
Kandelaskaia.....	67 10	30 21	Dagerort.....	58 56	22 10
Ponnoy.....	67 4	41 10	Arensberg	58 15	22 29
Cape Orlof			Swaverort.....	57 43	22 34
Cape Svatoi, ent. White Sea.....			Riga.....	56 56	24 2
			Windau.....	57 25	21 23
N. Coast, Lapland and Norway.			Liebau.....	56 31	20 55
			Prussia.		
			Memel.....	53 48	21 10
			Konigsberg	54 42	20 29
Kola.....	68 52	31 0	Dantzic.....	54 21	18 38
N. Cape, Lapland	71 10	25 50	Stralsund.....		
			Lubeck.....	53 51	10 41
W. Coast, Norway.			*Denmark.*		
Mael Strom.....	67 40		Fensburg.....	54 47	9 28
Drontheim	63 26	10 22	Copenhagen.....	55 41	12 34
Bergen.....	60 24	5 11	Scagen Point.	57 40	

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